

Using Integra Dermal Regeneration Template Single Layer Thin in practice

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This article is based on an advisory board meeting, which was held in Paris on 1st June 2018, and sponsored by Integra LifeSciences. The expert group was convened to discuss the use of Integra Dermal Regeneration Template (IDRT) Single Layer Thin (Integra LifeSciences) in practice: with the aim of sharing real-life experiences, discussing the potential benefits and agreeing on practical tips for use. Focussing on both surgeon and patient, the aim was to understand clinical need and challenges, translating into practical advice.

Integra Single Layer THIN is a single-layer IDRT, which has been developed to combine the proven technology of IDRT with a thinner scaffold, offering a complete solution for treating full-thickness skin defects in a one-step surgical procedure, while maintaining the same functional and aesthetic benefits of two-stage surgery (Integra, data on file).

The single-step procedure means that a thin layer of skin autograft (meshed or unmeshed) is applied directly over the Integra Single Layer Thin, which does not require additional waiting time for the formation of neodermis. This single-step procedure is indicated where the wound bed has adequate vascular supply to support the autograft through the Integra Single Layer Thin.

This means that a second skin grafting procedure is not necessary, which benefits the patient and provides knock-on practical benefits to the clinician (i.e. reduced time and cost, potentially reduced hospital stay). This may be of particular benefit to patients at extremes of age (elderly or paediatric), or those with comorbidities and/or poor general health, who may have limited tolerance to repeated procedures.

The expert group agreed that, based on their clinical practice, the progress from a two-stage to single-step procedure speeds healing and reduces hospital time, providing benefits to patients, practitioners and healthcare systems. Anecdotal evidence within the group also suggested that the increased speed of healing may be particularly beneficial to some patient groups — e.g. oncology patients, where

expedited healing enables radiotherapy to commence more quickly.

It is also important to bear in mind that the surgical process involves a psychological (and psychosocial) aspect for the patient, and treatment must focus on the individual patient, their expectations, experience and quality of life.

INDICATIONS AND CONTRAINDICATIONS

Integra Single Layer Thin is indicated in the following clinical scenarios:

- Post-excisional treatment of full-thickness and partial-thickness injuries, where sufficient autograft is not available at the time of excision, or is not desirable due to the physiological condition of the patient
- Reconstruction of post-excisional, full-thickness defects, where there is — in the opinion of the treating surgeon — a potential benefit to the patient by improving the reconstructive outcome or decreasing the risk of mortality/morbidity.

It should be noted that use of Integra Single Layer Thin is contraindicated in patients with a known hypersensitivity to bovine collagen, chondroitin or silicone materials; it should also not be used on clinically diagnosed infected wounds.

3D MATRIX LAYER

The technology of the 3D matrix layer guides healing at a cellular level, enhancing tissue regeneration, and thus providing long-term functional benefits (McMurray et al, 2015). In the normal wound healing process [Figure 1],

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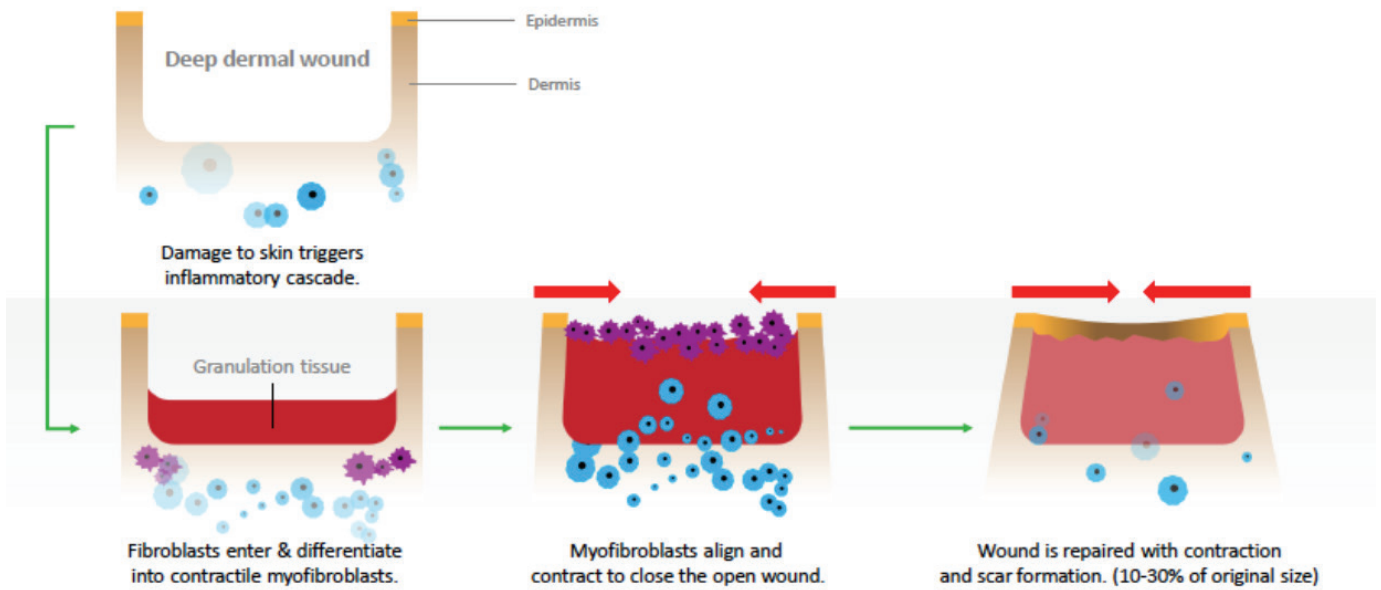


Figure 1. Normal wound healing process

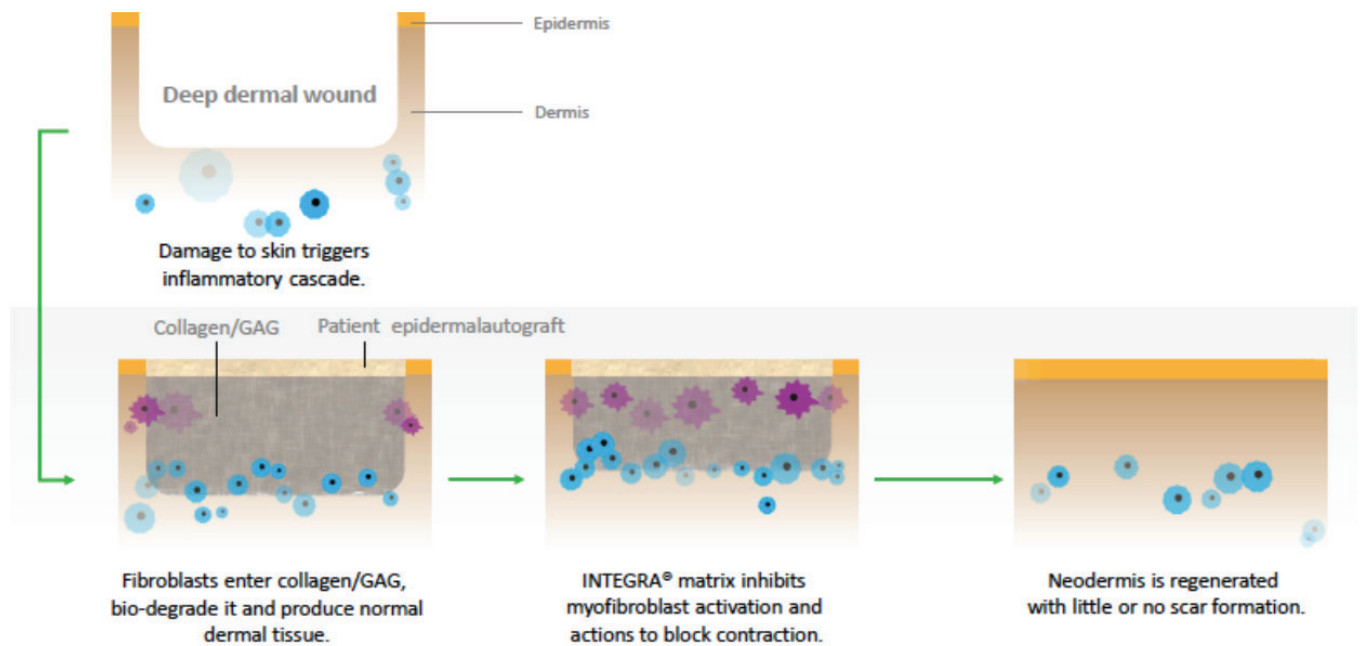


Figure 2. Wound healing process with 3D matrix layer.

myofibroblasts align and contract to close the open wound, which results in healed tissue that is more prone to contraction and scarring (Schultz et al, 2011).

The 3D matrix layer inhibits myofibroblast formation and actions, in order to block contraction [Figure 2]; this means that neodermis is regenerated with little or no scar formation.

PRACTICAL TIPS FOR USE

The expert group discussed and agreed on practical tips for use of Integra Single Layer Thin in practice, and how individual experience can

be extrapolated to different wound types and clinical scenarios.

Importantly, it was noted that all patients should have a full holistic assessment prior to commencing any treatment, in order to assess suitability.

Wound bed preparation

A standardised wound bed preparation protocol (e.g. the TIME principles; Dowsett and Newton, 2005) should be used. In particular, it is vital that the wound bed is free of any infected or necrotic tissue.

It is important to note that, for

Case 1: Necrotising Fasciitis.



Figure 3a and 3b: The patient on presentation.

This was a 72-year-old male, who was admitted under ENT for pansinusitis. The patient developed orbital swelling bilaterally, and renal failure, with necrotic tissue to the left and right eyelids after 2 days. He was reviewed by OMFS (oral and maxillofacial surgery), and required emergency surgical debridement of necrotic tissue. Three further visits to operating theatre were required before the wounds became stable [Figure 3a and 3b].

The wounds stabilised and renal function improved, with granulation tissue present over healthy soft tissue areas of exposed bone. The obicularis and majority of levator were removed on the left side, the tarsal plate partially removed on left, and supraorbital rim bone exposed on left side.



Figure 4a and 4b: The surgical procedure.

The wound bed was prepared with saline (fibrinous exudate removed) and Integra Single Layer Thin applied. A split-thickness skin graft was applied over Integra Single Layer Thin, with a tarsorrhaphy to the left eyelid. A silicone dressing was applied to the skin graft and a sponge dressing bolster placed for 10 days [Figure 4a and 4b].

The outcome was positive and the patient responded well — see Figures 5, 6 and 7 for the post-surgical outcomes.



Figure 5: The patient 2 weeks post reconstruction.

Figure 6: The patient 6 weeks post reconstruction.

Figure 7: The patient 12 weeks post reconstruction.

reconstruction, the wound should not be too tight at the edges — darts may be used if necessary.

Fenestrations

Creating fenestrations (i.e. small cuts) to the product can help to create a healthier environment that results in faster vascularisation and enhanced graft viability. The use of fenestrations can be of particular benefit where thicker grafts are required (i.e. to help to counteract thickness).

The expert group agreed that the material can be fragile and should be handled with care, but this does not preclude cutting where fenestrations are necessary – small cuts can be made without causing overall damage. The group noted that while the thinness of the layer causes fragility, this also results in good conformability.

Caution should be used to avoid any extra space or gaps from forming, which may result in losing some of the benefits associated with Integra Single Layer Thin and increase the risk of overgranulation.

DRESSING CHOICE

The expert group discussed and agreed on basic principles of dressing choice and fixation that may be beneficial in practice.

Wear time

The expert group agreed that dressing wear time is of paramount importance, as it is necessary for the wound to remain undisturbed with minimum potential disruption.

In the majority of cases, the first dressing change should not be conducted until after 7 days at the earliest (although this may not be the case in some acute patients or where infection risk is elevated).

At the 7-day point, the wound should be inspected and clinical judgement should be used — in some cases, upon inspection, dressing change may be left for longer than 7 days.

Relatedly, immobilisation is absolutely key to healing. While the extent of immobilisation that is possible varies according to the patient and individual scenario, the greatest degree possible is advised. The timing of patient discharge can affect this (e.g. lower limb patients being discharged after 48 hours), but patients should be advised on how to continue their own care in the home setting.

Negative pressure wound therapy

It was suggested that using negative pressure

Case 2: Orbital exenteration.

This was a 78-year-old female with a large rapidly progressive conjunctival squamous cell carcinoma (SCC) of the left eye [Figure 8].

The patient underwent orbital exenteration with rim of orbital bone for margin; with the conjunctival SCC excised with clear margin. The orbit was lined with Integra Single Layer Thin, placed directly over the bone and remnant of optic nerve at the orbital apex. A split-thickness skin graft was placed in the orbit over Integra Single Layer Thin. A silicone dressing was applied over the skin graft, and proflavin soaked sponge packed into the orbit, with an occlusive dressing placed over the wound [Figures 9a and 9b].

The dressings were changed weekly for 3 weeks and the wound healed fully in 8 weeks, with excellent graft take. This was a particularly good outcome as there was no delay to starting adjuvant radiotherapy [Figure 10].



Figure 8: The patient on presentation.

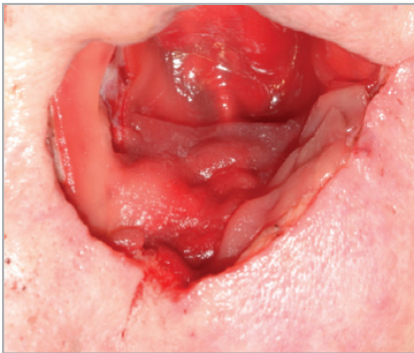


Figure 9a and 9b: The surgical procedure.

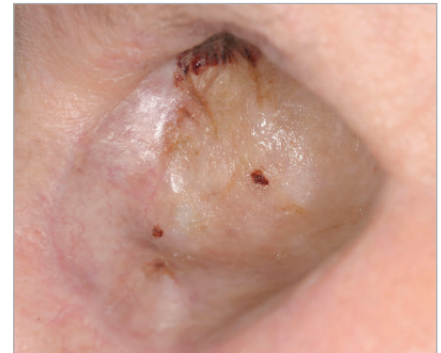


Figure 10 The patient 8 weeks post reconstruction.

Case 3: Deep burn to the hand.

This was an 18-year-old female, who sustained a deep burn to the hand [Figure 11], which required excision and immediate graft at Day 5 [Figure 12].

Integra Single Layer Thin was successfully used: the wound went on to heal within 15 days and the long-term results were excellent — see Figure 13a, 13b and 13c.



Figure 11: The wound at presentation.



Figure 12: The surgical procedure.



Figure 13a, 13b and 13c: The results 4 months post graft.

Case 4: Traumatic wound.



Figure 14: The wound on presentation.

This was a 78-year-old male with a traumatic wound of the left upper arm, with degloving syndrome and fracture [Figure 14].

A skin graft was successfully undertaken using Integra Single Layer Thin, with excellent long-term functional and cosmetic results — [Figures 15 and 16].

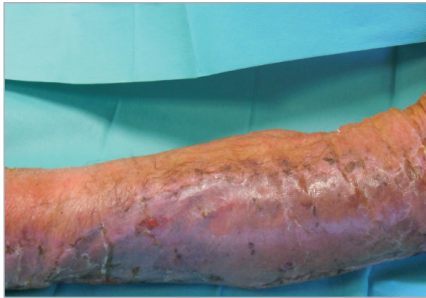


Figure 15: The wound at 18 days.

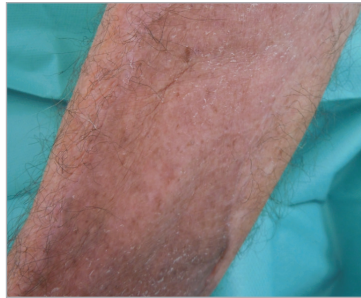


Figure 16: The wound after 5 months.

wound therapy (NPWT) in conjunction with Integra Single Layer Thin may be useful in practice. NPWT was found to help reduce initial bleeding and stabilise the wound. However, it was noted that high levels of negative pressure should not be used and it was recommended that NPWT should be continued only to a maximum of 5 days' duration. Additionally, moisture balance should be given particular consideration in cases where NPWT is used.

Fixation techniques

The expert group agreed that fibrin glue is not recommended for use. Staples are a good option in practice, as they are quick and efficient, and therefore reduce infection risk. Sutures may also be used where necessary.

EXPERIENCE IN PRACTICE

The expert group shared cases of patients where they have used Integra Single Layer Thin in a variety of different clinical scenarios, providing long-term follow-up results (of 1 year) where possible.

While clinical use and experiences varied, there were common factors that indicated a positive impact on patient outcomes:

- Generally good long-term results, for both functional and cosmetic outcome
- Reduced contraction and scarring.

It was agreed that this is a promising treatment, which requires more research and knowledge in order to create wider use in practice.

CONCLUSIONS

While it was agreed that further clinical experience and knowledge are still required, early case studies in practice have shown promising results. The availability of single-step surgical procedure has the potential to provide significant benefits to patients and practitioners, resulting in a positive impact on clinician time, resources and — crucially — patient outcomes and quality of life.

WINT

References

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Case 5: Surgical scalp wound.



Figure 17a, 17b and 17c: The surgical procedure.

This was an 89-year-old male undergoing an excision to the scalp, with a difficult wound bed involving exposed bone [Figure 17a, 17b and 17c]. The patient underwent excision to the bone, denuded from the periosteum. Integra Single Layer Thin was used in conjunction with an ultra-thin skin graft.

Despite the difficult wound bed and exposed bone, the outcome was successful, with good long-term results. See Figures 18, 19 and 20 for follow-up results at 7 days, 15 days and 11 months post surgery.

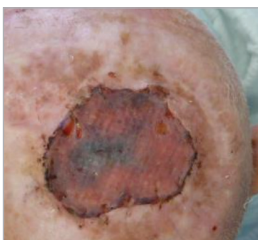


Figure 18: The wound at 7 days.

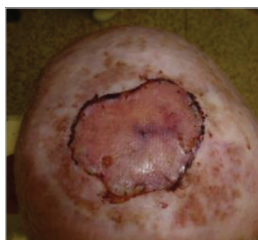


Figure 19: The wound at 15 days.



Figure 19: The wound at 11 months follow-up.