Biodegradable temporising matrix (BTM) for the reconstruction of defects following debridement for necrotising fasciitis and full thickness burns: a case series.

Ailbhe Coyle[1], Shane Carr[1], Jamie Martin-Smith[1], Brian Kneafsey[1].

1. Plastic & reconstructive surgery department,
Beaumont Hospital, Dublin 8.

IAPS
Irish Association of Plastic Surgeons

Background

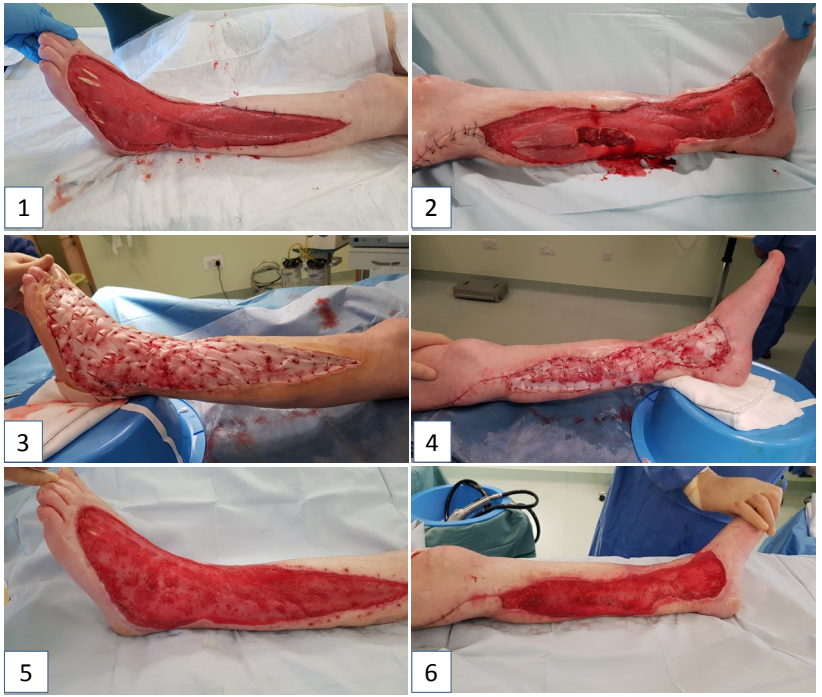
The mainstay of treatment for necrotising fasciitis involves serial debridement of the affected tissue. This can result in extensive and deep wounds, sometimes complicated by the exposure of major vessels, tendons, bone or other tissue incapable of supporting healing by skin grafts alone[1]. This is also true for severe full thickness burns where the surface area may be large and lacking a medium that can support extensive split thickness skin graft reconstruction[2]. Biological dermal substitutes are widely available (e.g. collagen/glycosaminoglycan) however, there are concerns regarding infection and loss of biological dermal substitutes in these scenarios when compared to their synthetic (eg polyurethane) counterparts[3].

Cases

In our case series, we reviewed one patient who was transferred to our facility following multiple left lower limb debridement surgeries for necrotising fasciitis that had resulted in exposure of his lower limb tendons (figure 1-2). He therefore required a flap for coverage or supplemental soft tissue medium in order to support split thickness skin graft reconstruction.

We also report one case of a hand held laser machine that caused a full thickness burn just proximal to the patient's right lateral malleolus down to her fascia (figure 7-8). This also required debridement and reconstruction but the patient was very concerned with the prospect of a contour defect that would be left if split thickness skin graft reconstruction was used alone. In both cases, there was an indication for the use of a dermal substitute to optimise the patients results.

Figure 1-6: Left lower limb necrotizing fasciitis wound



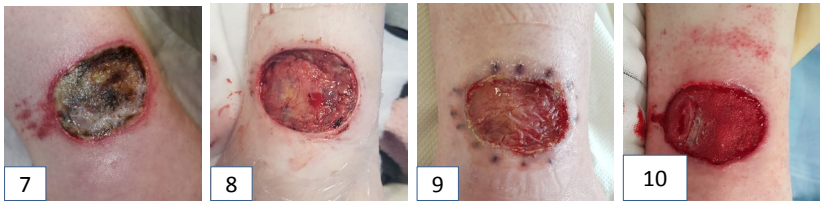
1-2: Post debridement of left lower limb necrostising fasciitis showing exposed tendons.
3-4: Post application of BTM (Novosorb).
5-6: Post removal of BTM membrane once fully integrated.

Cases continued

We therefore used a fully synthetic polyurethane biodegradable temporising matrix (BTM; NovoSorb) to provide the medium required to support the planned split thickness skin graft reconstruction (figure 3-4, 9). This matrix was allowed to integrate and become perfused with the help of negative pressure dressings (figure 5-6, 10) . Once fully integrated, both patients underwent secondary skin grafting and reapplication of negative pressure dressings to promote healing and reduce the risk of infection.

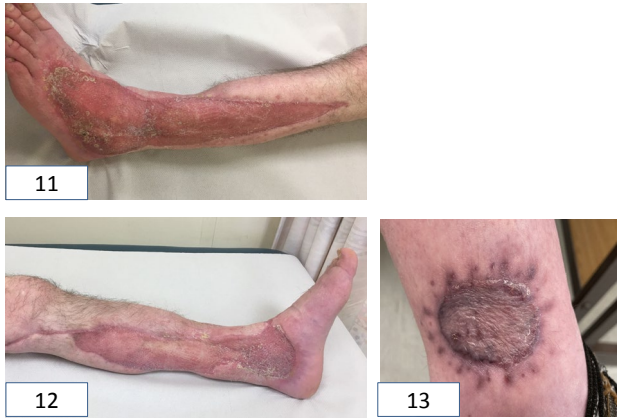
There was 100% take of both patient's split thickness skin grafts with no wound infection complications (figure 11-13). When reviewed in outpatients, the use of these matrices was seen to yield robust, soft, mobile and excellent aesthetic results. Both patients are currently undergoing physiotherapy, are mobilising well with minimal contracture and contour defects.

Figures 7-9: Full thickness burn, lateral malleolus



7: Full thickness burn prior to debridement.
8: Post debridement showing exposure of underlying fascia.
9: Post application of BTM (Novosorb).
10: Post removal of BTM membrane once fully integrated.

Figures 11-13: 8 weeks post split thickness skin grafting



IAPS Irish Association of Plastic Surgeons

Discussion

Synthetic dermal matrices can be applied to a wide variety of soft tissue defects, with a lower risk of wound infection and dermal loss than their biological counterparts[1-3]. These substitutes result in robust reconstructions with minimal contracture and act as a useful rung in the reconstructive ladder.

References

1. Wagstaff MJD, Salna I, Caplash Y, et al. ‘Biodegradable Temporising Matrix (BTM) for the reconstruction of defects following serial debridement for necrotising fasciitis: a case series’. *Burns Open*. 2019;**3**(1):12–30.

2. Greenwood JE, Schmitt BJ, Wagstaff MJD. Experience with a synthetic bilayer Biodegradable Temporising Matrix in significant burn injury. *Burns Open* 2018;**2**(1):17–34.

3. Cheshire PA, Herson MR, Cleland H, Akbarzadeh S. Artificial der- mal templates: a comparative study of NovoSorb Biodegradable Temporising Matrix (BTM) and Integra Dermal Regener- ation Template (DRT). *Burns* 2016;**42**(5):1088–96.