

# Use of a Biodegradable Dermal Matrix in Conjunction with Meshed and Sprayed Autologous Cell Suspension with a Vacuum Assisted Dressing Achieved Limb Salvage in a 73 Year Old with Deep Full Thickness Burns Despite Exposed Tendon and Bone

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## INTRODUCTION

Deep Full thickness burns require tangential excision of the burned tissues down to viable tissue. This often leaves exposed muscle, tendon and bone. Coverage of these areas is vital to limb salvage. These wounds often require multiple modalities to heal, such as, dermal matrix graft, split thickness skin graft, sprayed autologous cell suspension (ACS) and wound vacuum therapy (VAC). Biodegradable temporizing matrix (BTM), produced by PolyNovo Ltd, provides a scaffold for tissue and vascular en growth that is suitable for accepting a skin graft and it provides a layer between the muscle, tendon, bone, and the skin graft, improving movement and producing a more pliable graft. BTM was used to cover the muscle, bone and tendon.

BTM, when used in combination with a wide meshed skin graft at 3:1 ratio and a sprayed ACS allows for faster healing and less donor site usage which decreases the overall wound burden.

## METHODS

- 73 yo male presented with 24% deep full thickness burns to bilateral legs
- Initial wound management included multiple excisions to right (RT.) leg and irrigating, wound vacuum assisted closure device (VAC)
- Right leg wound consisted of muscle from thigh to foot with exposed tendons and anterior tibial bone
- Hospital wk 5, debrided with Versajet, placed in BTM, dressed with Mepitel Ag & VAC

### Wound Progression & BTM Application



Wk 5 Tibia & tendons exposed



Wk 5 BTM placed

## METHODS

- 4.5 wks post BTM placement, Neo-dermis mature, with vascularization and en growth
- BTM delaminated & wound bed prepared with Versajet
- Covered with 3:1 meshed STSG & autologous cell suspension prepared with RECELL®
- Intra-operative dressing, Telfa Clear™, Mepitel Ag™, & wound VAC (granulfoam @ 100mmHg), 1st dressing change @ day 5
- Donor sites sprayed with ACS

### Placement of STSG, Sprayed ACS & VAC



Rt. Leg 4.5 wks post BTM Placement



3:1 STSG & Spray-On Skin Cells



VAC dressing

## RESULTS

- Day 11, nearly 100% take of the STSG and sprayed ACS & donor sites were healed. Small area of failure noted over the patella tendon where the BTM did not incorporate. Likely due to lack of immobilization of his knee and a pseudomonas infection.
- 6 month follow up, wounds are healed, skin is flexible, pliable and has favorable coloring. Patient is ambulatory and happy with results.

## CONCLUSIONS

- BTM can be used to provide a suitable dermal substitute in complex wounds when muscle, tendon and/or bone are exposed.
- Immobilization of the joints is necessary to allow tissue en growth into the dermal matrix. Wide meshed graft with sprayed ACS can be used with good results with VAC
- Decreased wound burden and time to heal open wounds of the graft and donor sites.

### 6 Month Follow Up

**Skin:**  
Flexible, Pliable,  
Favorable Color



**Patient fully ambulatory  
and happy with results**





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BTM, when used in combination with a wide meshed skin graft at 3:1 ratio and a sprayed ACS allows for faster healing and less donor site usage which decreases the overall wound burden.

## METHODS

- 73 yo male presented with 24% deep full thickness burns to bilateral legs
- Initial management included multiple excisions & irrigating, wound vacuum assisted closure device (VAC)
- Right leg wound = exposed muscle from thigh to foot with exposed tendons and anterior tibial bone
- Hospital wk 5, debrided with Versajet, placed in BTM, dressed with Mepitel Ag & VAC

- 4.5 wks post BTM placement, Neo-dermis mature, with vascularization and en growth
- BTM delaminated
- Wound bed prepared with Verajet
- Covered with 3:1 meshed split thickness skin graft & RECELL®, autologous cell suspension
- Intra-operative dressing, Telfa Clear™, Mepitel Ag™, & wound VAC (granulfoam @ 100mmHg), 1<sup>st</sup> dressing change @ day 5
- Donor sites sprayed with ACS

### Wound Progression & BTM Application



Wk 5 Tibia & tendons exposed



Wk 5 BTM placed

### Placement of STSG & Spray-On® Skin Cells



Rt. Leg 4.5 wks post BTM Placement



3:1 STSG & Spray-On Skin Cells



VAC dressing

## RESULTS

At day 11, nearly 100% take of the STSG and sprayed ACS & donor sites were healed. A small area of failure noted over the patella tendon where the BTM did not incorporate. Likely due to lack of immobilization of his knee and a pseudomonal infection.

At 6 months, wounds are healed, skin is pliable with favorable coloring. Patient is ambulatory and happy with results.

### 6 Month Follow Up



Flexible, Pliable, Favorable Color

## CONCLUSIONS

- BTM can be used to provide a suitable dermal substitute in complex wounds when muscle, tendon and/or bone are exposed.
- Immobilization of the joints is necessary to allow the tissue en growth into the dermal matrix. Wide meshed graft with sprayed ACS can be used with good results with wound vacuum therapy.
- Decreased wound burden and time to heal open wounds of the graft and donor sites.





# Abstract

## Introduction

Deep Full thickness burns require tangential excision of the burned tissues down to viable tissue. This often leaves exposed muscle, tendon and bone. Coverage of these areas is vital to limb salvage. Multiple modalities are necessary with these type of patients, such as, dermal matrix graft, split thickness skin graft, sprayed autologous cell suspension (ACS) and wound vacuum therapy(VAC). A dermal matrix provides a scaffold for tissue and vascular en growth that is suitable for accepting a skin graft and also provides a layer between the muscle, tendon, bone and the skin graft which improves movement and produces a more pliable graft.

Biodegradable temporizing matrix(BTM), produced by PolyNovo Ltd, was used to cover the muscle, bone and tendon. This product has a silicone backing which can be delaminated once it has matured with tissue and vascular en growth for auto grafting.

A combination of a wide meshed skin graft at 3:1 ratio and a sprayed ACS allows for faster healing and less donor site usage which decreases the overall wound burden.

## Methods

A 73 y/o male with total body surface area burn of 24 % suffered deep full thickness burns to the bilateral lower legs. He underwent multiple debridements with management of the right leg with irrigating wound vacuum therapy. The deeper right leg had a wound base with that consisted of muscle from the thigh down onto the foot with exposed tendons and anterior tibial bone. The open wounds to the right leg were grafted with BTM for dermal substitute coverage. Once the BTM was mature it was delaminated, and the wound surface was covered with a 3:1 ratio split thickness skin graft (STSG) and sprayed on autologous cell suspension. This resulted in using less donor skin than a 1.5 or 2:1 meshed graft STSG which decreased his wound burden. Donor sites were also sprayed with ACS.

## Results

We had nearly 100% take of the STSG and sprayed autologous suspension epidermal graft. There was a small area over the patella tendon where the BTM did not incorporate. This is thought to be because of lack of immobilization of his knee and a pseudomonal infection.

Donor sites healed faster and there were minimal open areas to the graft POD 11 excluding the patella area.

## Conclusions

BTM can be used to provide a suitable dermal substitute in complex wounds when muscle, tendon and/or bone are exposed.

Immobilization of the joints is necessary to allow the tissue en growth into the dermal matrix. Wide meshed graft with sprayed ACS can be used with good results with wound vacuum therapy.

Decreased wound burden and time to heal open wounds of the graft and donor sites.