

Skin Graft Site Preparation for Soft Tissue Injury Utilizing a Synthetic, Biodegradable Polyurethane Matrix*

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Background

Necrotizing soft tissue injury is a devastating diagnosis. Accurate diagnosis and rapid debridement is the standard of care and the resulting skin loss for some patients can be as much as 50% TBSA. Although this method is lifesaving, patients often require significant skin grafts to cover areas with loss of dermis. Skin grafts are harvested from another part of the patient's intact skin in a very thin layer, frequently meshed to expand the harvested skin, and placed over the open wound areas created by the debridement of necrotizing disease. Ensuring that skin grafts have successful take is a primary goal and placing skin grafts onto a viable surface that will allow the skin graft to thrive is critical. Although placing the graft directly on the wound bed is an option, in some cases preparing the wound bed with a biologic or synthetic matrix prior to grafting results in better outcomes for the patient, including where deep structures such as bone/tendon are exposed.

Purpose

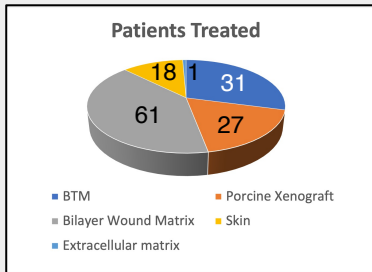
We discuss outcomes for patients who received a synthetic biodegradable temporizing matrix* (BTM) to temporarily close the wound and aid the body in generating new tissue in preparation for a skin graft after devastating loss of skin.

Methods

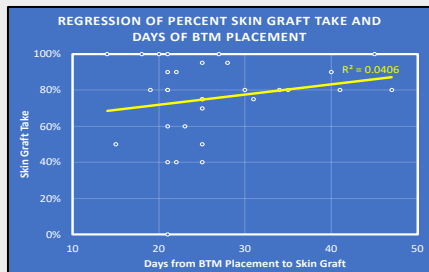
In our facility, 31 patients (14 necrotizing soft tissue, 17 burn) from 17 to 81 years in age received 83 applications of the synthetic dermal matrix over a period of 11 months. Patients had tangential excisions ranging between 525 cm² and 1900 cm². For 61% of these patients the BTM was covered with an antimicrobial contact layer and NPWT was applied. The other 39% of patients received an antimicrobial contact layer and bolster dressings over the BTM. Staples were initially used to secure the matrix in place in all cases and were removed in subsequent dressing changes.

Conclusion

Use of synthetic matrix to promote a healthy wound environment prior to skin grafting after soft tissue injury debridement had positive outcomes. Graft take was acceptable across placement durations of 14 to 47 days, creating latitude in scheduling surgeon and OR time for grafting. We also found the post-graft tissue quality to be soft and pliable relative to other methods. We plan to further study comparisons of the synthetic matrix patient data with other site preparation options.



Qualitatively we found post-graft tissue quality to be softer and more pliable after BTM relative to other methods used during the study period.



Skin graft take averaged 75%. BTM placement duration ranged 14 to 47 days before grafting. Our analysis indicates placement duration has minimal affect on skin graft take.

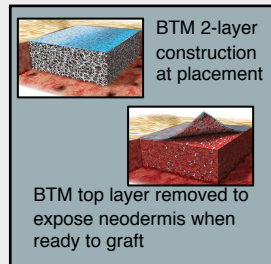
Case: Abdomen and ostomy



August 19, 2020
Initial debridement



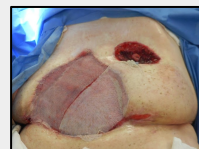
September 24, 2020
BTM placement,
secured with staples,
antimicrobial dressing
and NPWT



September 28, 2020
NPWT take down



October 8, 2020 BTM
top layer removal



October 8, 2020 Skin
graft placement

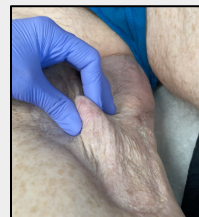


October 13, 2020 Post-
graft dressing change



October 20, 2020
Healed graft sites

Same patient: Comparing skin graft quality of leg to abdomen



Leg at did not
receive BTM prior
to skin graft. Scar
is denser and
tissue is harder
than abdominal
graft.



Abdomen
received BTM
prior to skin graft.
Scar is softer and
more pliable than
leg graft.