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# NovoSorb™ Biodegradable Temporizing Matrix (BTM) in the Complex Wound: A Retrospective Three-Year Review

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## Introduction

- A complex wound is a wound that exposes functionally important structures following debridement.
- NovoSorb™ Biodegradable Temporizing Matrix (BTM) is an entirely synthetic matrix, made from polyurethane open-cell foam, used in the closure of complex wounds.<sup>1</sup>
- In a complex wound, the BTM matrix is applied following wound debridement and before split-thickness skin grafting (STSG) to provide “dermal” structure in anticipation of the graft.<sup>2</sup>



- Unlike other matrices, BTM does not contain biological materials, such as collagen. Its synthetic nature makes BTM more resistant to infection.<sup>1</sup>
- BTM has been used at the Lehigh Valley Health Network (LVHN) regional burn center in the treatment of complex wounds since June 2017.

## Objective

To review all cases treated with NovoSorb™ BTM at the LVHN regional burn center regarding:

- Complications of treatment
- Success of wound closure
- Post hospital discharge outcomes

## Methods

- Institutional Review Board (IRB) approval and informed consent was obtained.
- Retrospective chart review of 33 patients identified as receiving application of BTM to a complex wound at the LVHN burn center, from June 2017 through May 2020.
- Data collected via EPIC chart review and stored in REDCap:
  - Patient demographics
  - Complex wound description
  - BTM data
  - STSG data
  - Post-op visit information
- Statistical analysis completed in Excel.

## Results

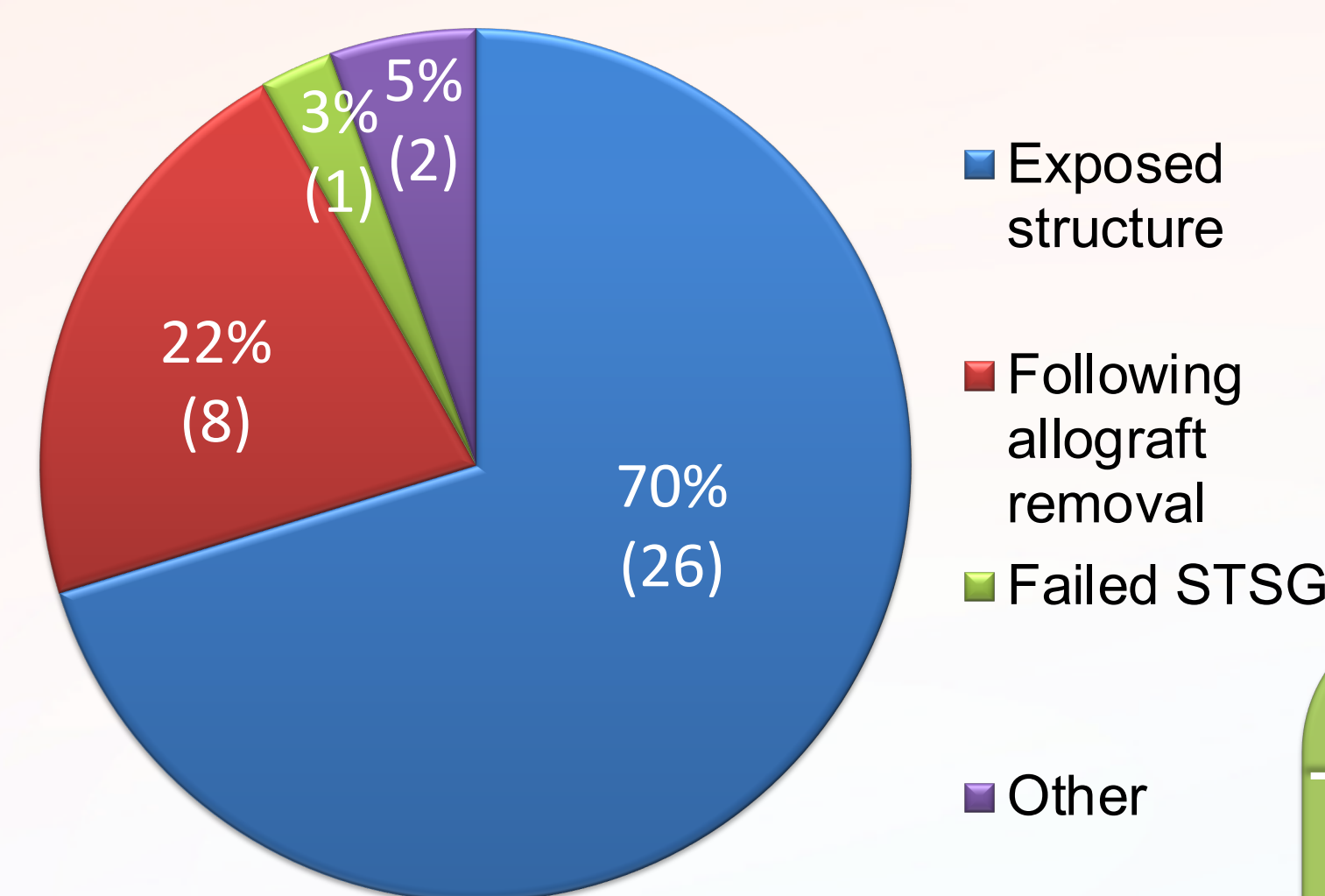
### Demographics

Complex wounds	37
Patients	33
Male	20 (61%)
Female	13 (39%)
Age Range	3 months to 72 years

### Complex Wounds

**Locations:** Head, neck, trunk, upper arm, lower arm, hand, thigh, lower leg, and/or foot  
**Causes:** Burn, infection, trauma, or amputation

### Reason for BTM Application to Complex Wound



**Table 1.** Complications relating to the BTM treatment in the complex wound.

Complications of Treatment	
Reapplication of BTM (for extra dermal support):	3 (8%)
Infection of BTM:	6 (15%)

**Figure 1.** Reason for BTM application to complex wound before STSG. The other cases were due to a failed Integra® matrix and an abscess.

**Table 2.** Success of wound closure relating to STSG.

Success of Wound Closure*	
Primary graft success:	35 (97%)
Secondary graft needed:	1 (3%)
Time between BTM and STSG	Average: 27 days
	Min: 7 days
	Max: 43 days

\* One patient passed away in the hospital due to sepsis and never received STSG.

### Post Hospital Discharge Outcomes

Decreased range of motion or gait abnormalities:	12 out of 24
Contracture:	12 out of 28 (10%-80% contracture)
Reopened wounds:	12 out of 32
Patient and Observer Scar Assessment Scale (POSAS) Rating	Average: 32
	Min: 16
	Max: 57
Vancouver Scar Scale Rating	Average: 9
	Min: 3
	Max: 13

**Table 3.** Complex wound outcomes evaluated from follow up office visits 13 days to 2.75 years post hospital discharge following STSG. Not all follow up information was available for every complex wound. Information was presented when available.



**Figure 2.** Photos documenting the healing process of a complex upper arm wound. (1) Initial debridement of wound via fasciotomy. (2) Wound post VAC and prior to BTM application. (3) BTM application to the complex wound. (4) Wound with integrated BTM prior to STSG. (5) Thin STSG applied to wound bed. (6) Healed complex wound 18 months post STSG.

## Conclusion

In the past 3 years of use at the LVHN regional burn center, BTM has proven to be a successful bridge to STSG, in complex wounds, with a primary STSG success rate of 97% and a low infection rate, with all infections treated locally. The post-hospital discharge outcomes are generally good due to the complexity of these wounds and the worse outcomes, such as amputation, that would have preceded without the use of this dermal matrix. Finally, BTM proved useful in both pediatric and adult patients, as well as in use on a variety of different locations throughout the body.

### References:

- Wagstaff MJ, Schmitt BJ, Coghlan P et al. . A biodegradable polyurethane dermal matrix in reconstruction of free flap donor sites: a pilot study. *Eplasty* 2015; : e13.
- Greenwood JE, Dearman BL. Split skin graft application over an integrating, biodegradable temporizing polymer matrix: immediate and delayed. *J Burn Care Res* 2012; : 7-19.