## Aseptically Processed Meshed Human Reticular Acellular Dermal Matrix\* Combined With Dehydrated Human Placental Allograft\*\* in Pressure Ulcer Reconstruction Michael N. Desvigne, MD, FACS, CWS, FACCWS; Krista Bauer (Montgomery), RN, WCC, OMS; Jody Wolfe, BSN, MBA, RN, CWOCN; Ashley L. Wardman, LPN Plastic & Reconstructive Surgery, Wound Care & Hyperbaric Medicine, Abrazo Arrowhead Hospital and Wound Clinic, Glendale, AZ

# INTRODUCTION

Flap mobilization is the mainstay of treatment in pressure injury to replace soft tissue loss. Successful outcomes are achieved when there is adequate tissue for transfer. When there is tissue deficiency, procedures may become more challenging, and outcomes may be compromised.

Aseptically processed meshed human reticular acellular dermal matrix (HR-ADM) is unique in that it comes from the reticular dermal layer that provides an open network structure to support tissue ingrowth. While these types of tissue forms are known to assist with secondary healing, this dermal matrix may also be used to support flap transfer.

# METHODS

We present a retrospective review of a series of surgical procedures for pressure ulceration over a 2-year period using aseptically processed meshed HR-ADM combined with aseptically processed dehydrated human placental mini membrane. Forty-six patients presented with 62 pressure ulcers, with some patients presenting with multiple ulcers. Forty-four patients underwent surgical closure. Eight patients underwent combination therapy of dehydrated placental mini membrane allograft with meshed HR-ADM to serve as a scaffolding for soft tissue support due to the complexity of the cases and lack of soft tissue.

# RESULTS

Thirty six patients had sufficient soft tissue for surgical closure. Eight patients required additional soft tissue support. These were treated with meshed HR-ADM and dehydrated humn placental mini membrane. Five of the eight patients healed without complications. One patient underwent 2 procedures with recurrent pressure injury, which we elected to treat with local wound care. The remaining patient also had recurrent pressure injury and was treated non-operatively. Both patients experienced wound progression to allow for secondary healing. In the cases that experienced dehiscence due to the complexity of the cases, the meshed HR-ADM had incorporated, covering the bone and rebuilding the deep soft tissue deficit. Even though dehiscence occurred, the bone was no longer visible. The integrated meshed HR-ADM was visible, which replaced the deep soft tissue loss.

# DISCUSSION

Meshed HR-ADM has properties that allow tissue integration and incorporation. Patients with deep soft tissue deficits common in pressure injury requiring flap reconstruction may benefit from meshed HR-ADM combined with human placental allograft for additional support to help create soft tissue ingrowth to help replace the soft tissue loss in pressure injury.

\*SomaGen<sup>®</sup> Reticular Dermal Matrix (MTF Biologics, Edison, NJ) \*\*Salera<sup>®</sup> Placental Allograft (MTF Biologics, Edison NJ)

Patient Information: 66 year old male following stroke developed a deep sacral ulcer that progressed down to the bone. Admitted for surgical intervention. Medical History: Colostomy

- **Treatment:**
- Taken to OR for excision ulcers and flap closure
- Dehydrated human placental mini membrane placed to support vascularization and soft tissue rebuild
- Meshed HR-ADM placed for tissue scaffolding and to support the flap
- Incisional V.A.C.<sup>®</sup> Therapy initiated with a PREVENA<sup>™</sup> CUSTOMIZABLE<sup>™</sup> dressing immediately following surgical closure **Outcome:** Surgical site remained closed, and no dehiscence was observed.



Figure 1A. Initial ulcer (Day 1)



Figure 1B. Application



ADM (Day 1)

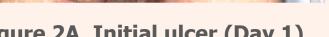
CASE 2

**Patient Information**: 77 year old male with incomplete quadriplegia from GSW. Previous flap surgeries. Presented with extensive sacral ulcer progressive despite local wound care. Admitted for surgical intervention. Medical History: CHF, DM, Colostomy **Treatment:** 

- Taken to OR for excision ulcers and flap closure
- Meshed HR-ADM placed for tissue scaffolding and to support the flap
- Dehydrated human placental mini-membrane placed to support surgical closure
- Incisional V.A.C.<sup>®</sup> Therapy initiated with a PREVENA<sup>™</sup> CUSTOMIZABLE<sup>™</sup> Dressing immediately following surgical closure

**Outcome**: Dehiscence at 6 weeks (due to the complex case, high-risk patient). However, the meshed HR-ADM was full incorporated, rebuilding the lost soft tissue.







B. Application of meshed HR-ADM (Day 1)



nembrane (Day 1)

## CASE 3

**Patient Information:** 42 year old female with incomplete quadriplegia from GSW. Presented with necrotic sacral ulcer, stage 4. Managed at outside wound clinic with progressive worsening ulcer. Admitted for surgical intervention.

#### Medical History: Urostomy

#### **Treatment**:

- Taken to OR for excision ulcers and flap closure
- Dehydrated human placental mini-membrane placed to support vascularization and soft tissue rebuild
- Meshed HR-ADM placed for tissue scaffolding
- Incisional V.A.C.<sup>®</sup> Therapy initiated with a PREVENA<sup>™</sup> CUS-TOMIZABLE<sup>™</sup> Dressing immediately following closure

**Outcome**: Dehiscence observed at 3 weeks (due to complex nature), however, the meshed HR-ADM incorporated and replaced the deep soft tissue loss. Secondary closure performed at 3 weeks.



(Day 1)



Figure 3D. Closure of wound (Day 1)

### CASE 1



Figure 2D: Would closure (Dav 1)

operatively. Allograft tissue incorpo-



**HR-ADM** with early incorpora tion. (Day 21)



Figure 3C. Application of meshed HR-ADM (Day 1)

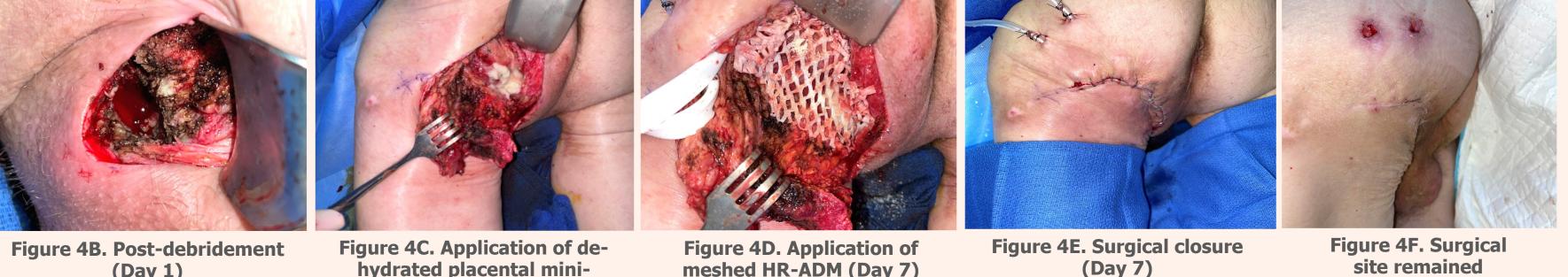


Figure 3F. Secondary closure performed (Day 21)

# **Medical History:** Paraplegia, CRI, Depression, Malnutrition

- Admitted to hospital for acute infection left ischial ulcer
- V.A.C.<sup>®</sup> VeraFlo<sup>™</sup> Therapy initiated with Cleanse Choice dressing V.A.C.<sup>®</sup>
- Taken to OR for staged debridement and VeraFlo<sup>™</sup> therapy
- Dehydrated human placental mini membrane placed to support vascularization
- **Outcome**: Surgical site remained closed and no dehiscence observed.





pressure ulcer (Day )

(Day 1)

Medical History: Paraplegia, Worsening Nutritional status **Treatment**:

- Taken to OR for staged debridement
- Taken to OR for flap closure with meshed HR-ADM placed as tissue scaffolding for soft tissue replacement
- Dehydrated human placental mini membrane allograft placed to support vascularization
- Incisional V.A.C.<sup>®</sup> Therapy initiated with a 3M<sup>™</sup> Prevena<sup>™</sup> Customizable Dressing immediately following surgical closure
- Returned to clinic with failed flaps
- V.A.C.<sup>®</sup> Therapy for wound bed preparation
- Promogran Prisma initiated with V.A.C.<sup>®</sup> Therapy to assist with healing

**<u>Outcome</u>**: Failed flap at 6 weeks due to surgical dehiscence, however meshed HR-ADM was fully incorporated and covered the bone.



igure 5A. Left hip ulcer, stage 4 with necrotic debris (Day 0)

- trial. *Int Wound J*. 2018:1-9.





**Patient Information**: 53 year old male with paraplegia secondary to traumatic fall in 1993 presented with infected pressure ulcer.

- Meshed HR-ADM placed as tissue scaffolding for soft tissue replacement
- Incisional V.A.C.<sup>®</sup> Therapy initiated with a PREVENA<sup>™</sup> CUSTOMIZABLE<sup>™</sup> Dressing immediately following surgical closure

ydrated placental min membrane (Day 7)

CASE 5

**Patient Information**: 49 year old male with paraplegia admitted to hospital for multiple pressure ulcers worsening despite wound management and offloading.

• 3M<sup>™</sup> Veraflo<sup>™</sup> Therapy initiated with 3M<sup>™</sup> V.A.C. Veraflo Cleanse Choice<sup>™</sup> Dressing

• 3M<sup>™</sup> Veraflo<sup>™</sup> Therapy initiated with 3M<sup>™</sup> V.A.C. Veraflo Cleanse Choice<sup>™</sup> Dressing

closure (Dav 7)



Figure 5C. Application of meshed HR-ADM placed as soft tissue scaf-



(Day 7)



al dehiscence pos Meshed HR-ADM incorporated

# REFERENCES

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mis improves healing in diabetic foot ulcers: A prospective, randomized, controlled, multicenter follow-up