**Aseptically Processed Placental, Dermal and Adipose Tissue Matrices For Soft Tissue Reconstruction: A Review of 145 Cases**

Michael N. Desvigne, MD, FACS, CWSS, FACWS; Krista Bauer (Montgomery), RN, WCC, OMS; Kurt Holifield, RN, BSN, WCC, OMS; Kari Day, RN, BSN, WCC; Denise Gilmore, RN; Ashley L. Wardman, LPN

Abrazo Arrowhead Hospital, Glendale, AZ

**BACKGROUND**

Surgical reconstruction of chronic wounds using a team of surgeons as a surgical approach to achieve closure. Due to the tissue quality, longstanding infection, ulcers and impaired blood supply, the success of flap closure is hindered by repeated complications rates of 25%-30%.

Placental and dermal allografts are commonly used for resolving chronic wounds. To date, little has been reported about the use of these tissue forms to enhance surgical outcomes.

- Using aseptically processed placental and dermal grafts without terminal sterilization is known to maintain the inherent growth factors and matrix proteins native to the tissue. Of which are known to support wound healing.
- We hypothesize that these tissue forms, that have been utilized for chronic wound progression, may also be beneficial for patients with ongoing surgical wound dehiscence.

**PURPOSE**

We present a retrospective review of a series of 145 surgical reconstructive procedures over a 2 year period using aseptically processed placental, dermal and adipose allografts without terminal sterilization, which is known to maintain the inherent growth factors and matrix proteins native to the tissue.

**METHODS**

A retrospective review was performed from January 2016 through January 2018. In total of 145 surgical reconstructive cases were performed utilizing aseptically processed placental, dermal and adipose allografts without terminal sterilization (MTF Biologics, Edison, NJ).

- Aseptic processing maintains the inherent biomolecules and collagen by the hospital from tissue donation agencies and Abrazo Arrowhead Hospital, Glendale, Arizona.

- Items were selected for surgical reconstruction for chronic non-healing wounds who were benefit from surgical closure to expedite healing and/or if they failed to progress with medical management.

- Advanced tissue forms were chosen to enhance surgical outcomes as well as to assist with wound bed preparation if intended surgical outcome was not successful.

- Excluded surgical outcomes, wound outcome and patient satisfaction.

- Three cases are presented here as examples.

**RESULTS**

- **Patient demographics**: 145 patients (52 males, 42 females, Age range 19-96, Avg age 64), 145 procedures performed, some patients had bilateral versus dual ulcers and multiple pressure ulcers.

- **Diagnosis**: 45 pressure ulcers, 16 venous stasis ulcers, 13 non-healing surgical wounds, 20 miscellaneous (including necrotizing infection, skin and soft tissue infections and diabetic foot ulcer).

- No perioperative complications or infection were observed.

- Most common complication was wound dehiscence in pressure ulcer patients (22%).

- When there was a postsurgical wound complication and/or delayed healing, most were able to surgically reclosed and/or heal with medical management.

- Most common complication was wound dehiscence in pressure ulcer patients (22%).

**CONCLUSION**

The addition of aseptically processed allografts without terminal sterilization to reconstructive surgical flaps may improve outcomes.

**REFERENCES**


4. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

5. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

6. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

7. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

8. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

9. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

10. Zelen CM, Orgill DP, Serena TE, et al. Use of an aseptically processed, dehydrated human amnion and chorion membrane improves the likelihood and rate of healing wounds who would benefit from surgical closure to expedite healing and/or if they failed to progress with medical management. A prospective, randomized, multi-center trial.

**CASE STUDIES**

**CASE STUDY 1** (Dehydrated human amnion particulate allograft®, Human reticular acellular dermal matrix®, Dehydrated human amnion/chorion membrane®):

A 24 year old male presented with a history of sinuscessus excision left lower extremity, followed by a Sundale cell tumor excision requiring femoral rod replacement, free tissue flap transfer, and postoperative radiation. The patient developed a non-healing wound at the surgical incision, which extended to the bone and hardware. Advanced tissue matrices were used to optimize potential healing of the site, as the hardware while exposed, did not appear grossly infected. In the operating room, the non-healing wound was excised, the hardware was imaged using placement of dehydrated human amnion particulate allograft (dHAPA) and human reticular acellular dermal matrix (HRADM) to “fill” the dead space. Postoperatively, a small fundus remained that ultimately healed following weekly placement of dehydrated human amnion/chorion allograft (DHAC) membranes.

**CASE STUDY 2** (Meshed human reticular acellular dermal matrix®):

A 66 year old male with h/o DVT presented with left lower extremity complex wounds with full thickness necrosis. Methicillin-resistant Staphylococcus aureus (MRSA) was isolated. Patient was taken to OR for staged debridement. On Day 7, meshed human reticular acellular dermal matrix (HRADM) was placed to serve as a scaffold to expedite healing. NPWT was continued as outpatient. 6 weeks later, meshed HRADM was completely incorporated into deep tissue. Patient returned to OR for split thickness skin graft and healed at 3 months, with a happy resolution.

**CASE STUDY 3** (Acellular adipose matrix®):

A 70 year old female with a history of chronic foot ulceration in multiple areas of the left lower extremity developed a non-healing wound requiring femoral rod replacement, free tissue flap transfer, and postoperative radiation. Prophylactic antibiotics were utilized in the operating room to reduce the risk of deep vein thrombosis (DVT). Treatment included hospital admission for IV antibiotics for persistent infection with full thickness necrosis. NPWT was continued. Patient was taken to OR for staged debridement. On Day 7, meshed human reticular acellular dermal matrix (HRADM) was placed to serve as a scaffold to expedite healing. NPWT was continued as outpatient. 6 weeks later, meshed HRADM was completely incorporated into deep tissue. Patient returned to OR for split thickness skin graft and healed at 3 months, with a happy resolution.

**CASE STUDY 4** (Acellular adipose matrix®):

A 69 year old man with a previous below the knee amputation, 40 years ago from a mining accident, presented with a pressure injury over the lateral aspect of the right lower extremity. The patient had undergone outpatient wound reconstruction (local anesthesia in office) to include excision of the non-healing wound and closure. Due to tissue atrophy and secondary boney prominence causing the pressure point for the prosthesis, it was elected to place allograft adipose matrix (AAM) to support hold adipose growth and cushioning. The AAM (Tec) was placed under direct visualization into the soft tissue overlying the bone. Additional AAM was added at 6 weeks. Wound healed uneventfully. Soft tissue was enhanced at 3 months.