Dehydrated human amniotic membrane allograft (DAMA) Used to Treat Recalcitrant Wounds: A Case Series

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Abstract

Chronic wounds can require advanced wound care modalities to achieve closure. Tissue products derived from amniotic tissue are newer tools in the wound care armamentarium. [1, 2, 3,4]

A case series is presented of four patients with stalled wounds of unusual etiology. The patients had wounds that had not progressed despite advanced care; including negative pressure wound therapy, low-frequency, non-contact ultrasound and other cellular and tissue-based products. The DAMA matrix and a cryopreserved amniotic suspension allograft (CASA) liquid** were trialed over a 6-week period. The DAMA/CASA was applied every two weeks. 2 patients healed completely within the first month and the other two patients had wound closure of 33% and 70% respectively.

DAMA/CASA is a very effective therapy for closure in recalcitrant wounds. It should be considered as a therapy for wounds of all etiologies based on its ability to convert chronic wounds to acute healing wounds.

Methods and Materials

Each patient was treated on a 2 week interval. If the CASA liquid was applied (cases 1-3), the site was prepared with a chlorhexidine scrub and then periwound was injected at 12, 3, 6 and 9 o'clock using a subcutaneous needle. Each aliquot was placed at approximately 0.5cm away from the wound and 1-1.5cm deep.

For the patient who received DAMA matrix (cases 2-4), the wound beds were prepared using a chlorhexidine scrub and then the matrix was adhered in place with steri-strips and then covered by a non-contact layer and a polyurethane foam dressing.

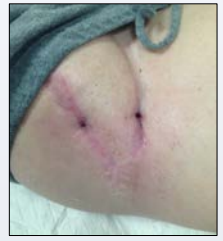
Each patient was assessed 2-3 times per week. The DAMA was left undisturbed and the secondary dressing was replaced.

The liquid CASA was a one cc or two cc vial that was mixed 1:1 with 1% xylocaine prior to injection. The amount applied was based on the size of the wound in order to deliver a consistent amount to the periphery.

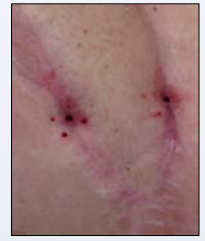
DAMA matrix came in various sizes, which were then cut to fit each wound bed, but slightly overlapping each wound bed.

Case 1

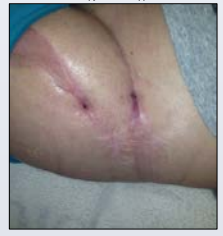
The 1st patient is a 29 year-old female with chronic sinus tracts over an infected hip implant. The implant was removed but the wounds did not change in size in 3 months. Both wounds closed in 2 weeks after a single injection of liquid CASA. The right wound re-opened 1 week later, but again closed with a single injection of liquid CASA.



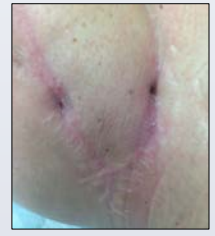
Initial wound measurements: Proximal tract was 3.5cm deep. Distal tract was 0.8cm deep. No decrease in size for 3 months. Despite aggressive local therapy and ECM application.



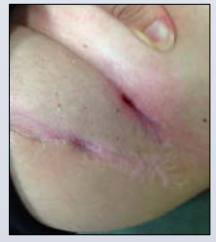
Needle marks after each aliquot deposition. Aim for 12, 3, 6 and 9 o'clock. The 6 o'clock was slightly lateral due to scar tissue.



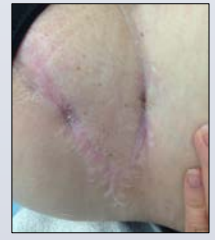
At one week post CASA liquid application, the Proximal wound was 1.5cm deep and the distal was 0.4cm deep.



Wounds were almost closed at 2 weeks post application.



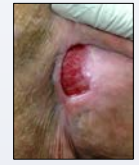
At 3 weeks post initial application, the proximal wound reopened to 0.8cm depth.



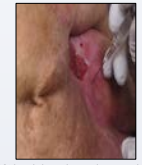
Completely closed at 4 weeks post Initial application. Wounds stayed closed and Patient was able to have a new hip implant placed.

Case 2 and 3

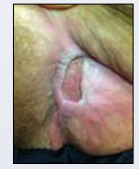
The 2nd patient is a 22 year-old with a perineal wound for one year after a fasciocutaneous flap retracted back over his left hip. He is a left hip disarticulation and a right above knee amputee. His wound did not decrease for approximately 12 weeks prior to treatment. He closed 33% in six weeks of DAMA and CASA therapy.



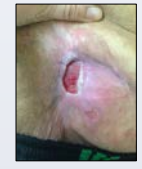
Initial wound measurement: 3.5 x 2.5 x 0.1cm



CASA liquid aliquot being administered. Angle the needle to 90 degrees from the wound.



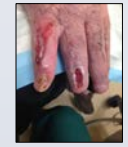
Improved to 3.0 x 2.0 x 0.1cm after 2 applications of DAMA liquid and matrix.



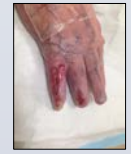
Final measurements at the end of the trial: 2.8 x 1.6 x 0.1cm.

The 3rd patient is a 35 year-old male with full-thickness wounds on the dorsum of the 4th digit on his right hand after sustaining 3rd degree burns in a car accident 6 months prior. It was closed in 4 weeks. The 5th digit was not salvageable due to osteomyelitis.

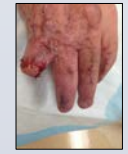
Initial wound images- Measured 1.5 x 1.0 x 0cm. Wound was hypergranulated.



Week 2: DAMA matrix visible on wound bed.



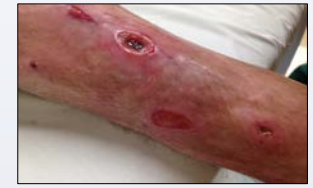
Wound improved after 2 applications of DAMA matrix and 1 of CASA liquid. Liquid was Not as successful due to lack of subcutaneous tissue.



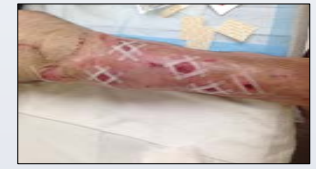
Wound closed 5 weeks post Initial DAMA applications.

Case 4

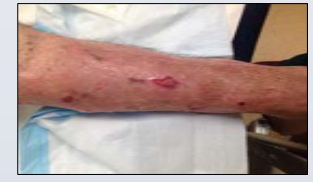
The 4th patient is a 25 year-old with heterotopic ossification (HO) throughout his posterior calf. He developed new open wounds from HO formation after limb salvage after an IED blast. His wounds closed by an average of 20%/week with the application of DAMA every other week. 4 of 6 wounds closed completely.



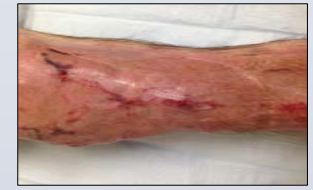
Initial wounds prior to DAMA matrix applications. Range in size from 3x4x0.5cm to 0.5 x 0.5 x 0.5cm.



After application of DAMA matrix. The CASA liquid was not used to the extensive bone formations in the subcutaneous tissue.



Patient received a new application every 2 weeks. Standard of care was maintained in the interim.



At the conclusion of the trial, 4 of 6 wounds were closed completely. 2 were almost closed.

Discussion and Conclusions

The use of DAMA and CASA gives yet another powerful tool for the wound care armamentarium. Here, a case series was presented of 4 patients with recalcitrant healing of various wound etiologies. There are some indications that would preclude the use of the liquid CASA. Specifically, if there is bone close to the surface of the wound, there may not be enough subcutaneous tissue present to absorb the product effectively. The liquid form was trialed once on the 3rd patient and it was not effective, so the matrix version was only used after that. Likewise, in case 4, the patient suffered from heterotopic ossification, which is mature lamellar bone in subcutaneous tissue. In the author's opinion, the CASA liquid would have not been as effective in this incidence.

Overall, the DAMA and CASA products were successful in closing previously recalcitrant wounds during this trial. These patients were young and otherwise healthy, without the typical chronic diseases associated with delayed wound healing, yet their wounds did not close. A wider evaluation of these products on patients with chronic diseases, such as venous insufficiency and Type 2 Diabetes Mellitus is warranted due to the remarkably fast response seen in these patients. Dosing parameters and treatment regimens will be adjusted as more data is gathered.

References

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Acknowledgements and Contact

I wish to thank the men and women of our Armed Forces for their sacrifice for our country and all of the good humor that they had during our many hours of treatment to heal their wounds. I am forever grateful for your willingness to advance science and wound healing. You are my heroes.

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**CASA liquid- AMNIOMATRIX is a registered trademark of BioD, LLC made available by Derma Sciences Inc., Princeton, NJ

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