
Case Study
Challenge
Insulin-dependent diabetes mellitus and history of tobacco use.

Patient Profile
A 56-year-old Caucasian female was referred for consultation for right breast reconstruction. The patient had been diagnosed with right breast cancer following a positive mammogram and biopsy. The patient decided to undergo mastectomy. Significant co-morbid factors included insulin-dependent diabetes mellitus and history of tobacco use. The patient had smoked one pack of cigarettes a day for 40 years but had ceased smoking prior to the consultation. She had researched breast reconstruction information and was very interested in using autologous tissue. This was discussed relative to her diabetes and smoking history, as well as an alternative option for reconstruction with a tissue expander and implant. The patient, however, desired transverse rectus abdominus myocutaneous (TRAM) flap reconstruction; she was informed of the high risk of TRAM flap failure and donor site morbidity.

Surgical Treatment
The patient underwent a right modified radical mastectomy and sentinel lymph node biopsy, breast reconstruction with a single pedicle TRAM flap, and closure of the abdominal donor area with 6 cm x 12 cm DermaMatrix ultra-thick acellular dermis. The acellular dermis was secured with both horizontal mattress 0-Nurolon sutures as well as a fascial stapling device. The patient tolerated the procedure well and was discharged to home four days later.
**Postoperative Treatment**

Six days postoperative, blistering on the lateral portion of the breast reconstruction site and blistering between the umbilicus and suprapubic abdominal wall incision were noted. She was treated with local wound care, which included Silvadene dressing changes. At two weeks postoperative, some demarcation of the tissues on the right TRAM flap and inferior mastectomy flap, as well as the lower portion of the abdomen, was noted. By three weeks, eschars had formed on these areas and the patient underwent debridement of the skin and subcutaneous tissues of the abdominal wall (an area approximately 13 cm x 8 cm) and right inferior portion of the TRAM and mastectomy flaps. Two days after debridement, a wound VAC was placed on these debridement areas.

One month after breast reconstruction with pedicle TRAM flap, and one week post-debridement, the wound VAC was removed and granulation tissue was noted to be developing on the open area of her lower anterior abdominal wall (figure 1). This area had exposed native fascia on the right lower abdominal wall and DermaMatrix tissue on the left side of the wound. During debridement, an approximately equal area of the right abdominal wall fascia and left-sided DermaMatrix tissue had been exposed. The following week, the patient was diagnosed with metastatic breast cancer, which included bony metastases, and started chemotherapy.

Additional photographs of the wound were taken at one-month intervals (figures 2 and 3).
After almost four months of treatment with the wound VAC to the anterior abdominal wall area and right TRAM flap mastectomy area, the mastectomy area had healed and completely epithelialized and the abdominal donor area had granulated flush. This occurred even while the patient continued to receive chemotherapy. A split-thickness skin graft for wound coverage was planned; however, the patient became too ill to undergo surgery. She was started on wet to dry dressing changes and the wound continued to epithelialize (figure 4).

At four months post-debridement the wound was almost completely healed (figure 5), and a 3 mm punch biopsy was taken from the DermaMatrix side and sent for histology.
Results
By one month post-wound-VAC placement on the anterior abdominal wall defect, healthy granulation tissue was noted growing on both the DermaMatrix tissue and fascia sides. The patient was followed weekly in the office. [Photographs of the granulation tissue developing on the DermaMatrix acellular dermis on the left, and the native fascia on the right side, were taken at approximately one month intervals (figures 1–5)]. Throughout this time, granulation tissue appeared to form at an equal rate on both sides.

Figure 6: Hematoxylin and eosin stain of the punch biopsy showed epithelialization of DermaMatrix graft at four months post-debridement (shown at 20x)

Figure 7: Trichrome stain of the punch biopsy showing the DermaMatrix graft with vascular and tissue in growth at four months post-debridement (shown at 40x)
Summary
This case represents the use of DermaMatrix acellular dermis for abdominal wall reconstruction in a patient undergoing right breast reconstruction, post-mastectomy for cancer. This was a high-risk patient, who developed a postoperative complication and exposure of both abdominal wall fascia and the acellular dermis. With use of a wound VAC, healthy granulation tissue developed at an equal rate on the exposed fascia and the acellular dermis. The defect eventually healed with epithelialization.

Conclusion
The preliminary conclusion is that DermaMatrix acellular dermis allows tissue ingrowth and provides a vascular bed equal to that of native fascia, to allow a large abdominal wound to heal successfully. There also appeared to be no difference in abdominal wall integrity on the DermaMatrix side versus the native fascial side.

“While I have also used another human acellular dermis product in breast reconstruction, I have found that DermaMatrix acellular dermis handles easier, with a less ‘slippery’ feel and seems to hold sutures better. It has also been my experience that the thickness of DermaMatrix (tissue) is more uniform throughout the entire graft piece.”

–W. Harry Caulfield III, MD, FACS
### Commonly used sizes for abdominal wall reconstruction

**DermaMatrix Acellular Dermis**

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### Surgeon profile

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