



Long-term Follow-up with AlloDerm in Breast Reconstruction

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Summary: Little is known about the long-term fate of acellular dermal matrices in breast implant surgery. A 12-year follow-up case with tissue analysis of AlloDerm in revision breast reconstruction reveals retention of graft volume and integration with an organized collagen structure, minimal capsule formation, and little or no indication of inflammation. (*PRS GO 2013;1:e12; doi:10.1097/GOX.0b013e318293a160; Published online 7 May 2013.*)

Acellular dermal matrices (ADMs) are now routinely used in implant-based breast reconstruction and revision breast surgery.¹ Their use is supported, in part, because of histologic evidence that they function as a template for tissue regeneration. However, the very long-term fate of ADMs remains to be documented. A patient recently presented for revision surgery 12 years after placement of AlloDerm in a breast reconstruction setting, providing a unique opportunity for evaluation.

CASE

A 49-year-old woman who has undergone postbilateral mastectomy for ductal carcinoma in situ presented for revision after expander to implant reconstruction (Fig. 1A). Despite a reportedly uncomplicated course, she had previously undergone 1 revision for implant malposition. Her concerns were asymmetry, visible rippling, a wide intermammary space, and unnatural appearance. She was not willing to consider flap procedures. Periprosthetic tissue coverage was thin with a pinch test of 5 mm over the upper pole.

The patient underwent revision with implant replacement and capsule revisions with medial capsulotomy, a right inferolateral capsulorrhaphy, and a series of four 4 cm × 7 cm pieces of AlloDerm for

pocket reinforcement on each side (larger pieces were unavailable at that time). She did well for more than a decade but gradually developed relapse of fold malposition on the right side and requested bilateral implant exchange to a smaller size. (Fig. 1B) This provided the opportunity to inspect the condition of the AlloDerm visually and sample the material for histology, with the patient's consent.

During surgery, the grafts were observed to be incorporated and seemed to have retained volume (Fig. 2). Portions were excised for histologic analysis, and there was bleeding when the grafts were incised.

Histopathological analysis of the biopsies (Fig. 3) indicated the presence of an organized connective tissue with oriented collagen fibers similar to a fascia-like appearance although there was some variation between the 2 breasts in the extent of the collagen orientation. There was no evidence of capsule or a fibrotic response at the implant-ADM interface (deep side). On the superficial side of the ADM, there was evidence of a modest cellular infiltration with the presence of blood vessels. There was no evidence of an inflammatory reaction or a foreign body response throughout both samples.

DISCUSSION

Early concerns about the use of a biologic matrix as an onlay in a breast implant capsule were allayed by histologic documentation of graft incorporation.^{2,3} The fate of acellular matrix grafts in the periprosthetic space may hinge on the concept of tissue regeneration, which in turn may rely on a minimally altered matrix. Various graft processing techniques

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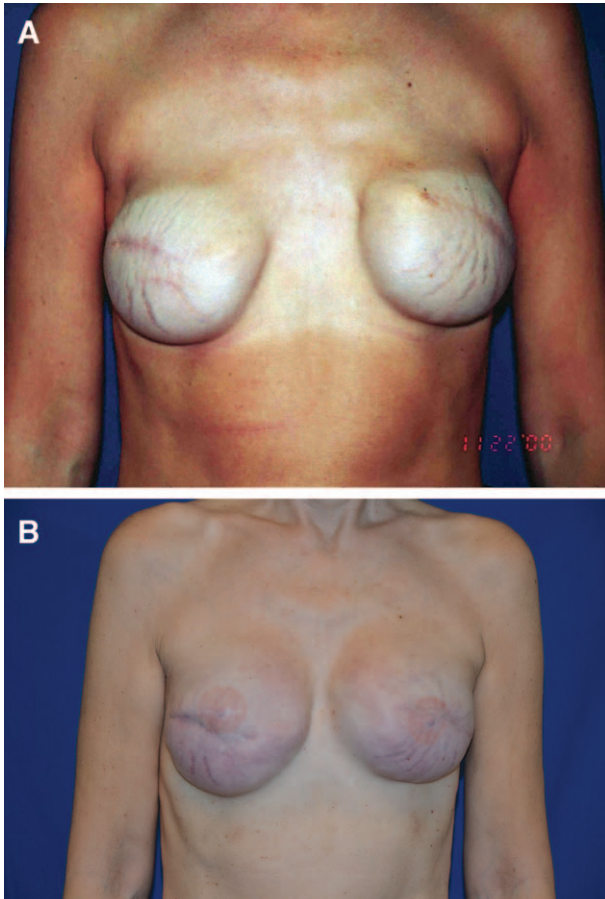


Fig. 1. A, Postreconstruction with expander-implant sequence and 1 revision. B, Same patient 12 y after revision using AlloDerm.



Fig. 2. Intraoperative view of AlloDerm onlay graft after 12 y.

may provoke a negative recognition response, characterized by either encapsulation or resorption, and eventual replacement by scar. Although only a single case, this report provides evidence that human-derived ADM can become stable tissue with maintenance of volume over the very long term.

In practical terms, this case also highlights lessons learned about optimizing use of ADMs. Fixation in

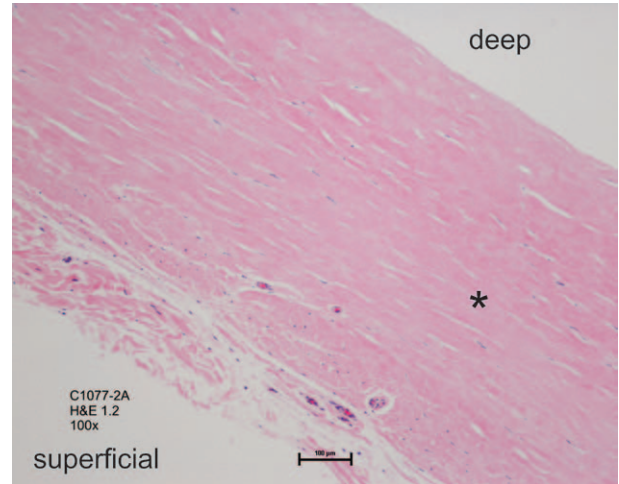


Fig. 3. AlloDerm-associated connective tissue. There is no evidence of capsule formation on the implant side (deep).

this case was with polyglactin sutures, which may resorb before secure adherence can occur. Many surgeons now prefer a more slowly resorbing suture such as polydioxanone. Another early change was to advance a cuff of ADM on the posterior capsule instead of end-on to the chest wall at the junction between the anterior and posterior capsule as was done in this case. This creates a broader zone of adherence and potentially more secure long-term fixation. Additionally, the use of single pieces large enough to serve as a pectoral extension has become the standard model, as opposed to the patchwork approach used before larger pieces were available.

CONCLUSIONS

Human-derived acellular dermal matrix applied as an onlay to a breast implant capsule is capable of transforming into organized de novo connective tissue that remains stable over many years. Comparative data on the long-term fate of various materials commonly used in breast reconstruction and revision breast surgery remains to be studied.

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