

Acellular Dermal Matrix (ADM) Products Used in Implant-Based Breast Reconstruction Differ in Complication Rates: FDA Safety Communication

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The U.S. Food and Drug Administration (FDA) is informing patients, caregivers, and health care providers that certain acellular dermal matrix (ADM) products used in implant-based breast reconstruction may have a higher chance for complications or problems.

There are several methods for reconstructing the breast following mastectomy (surgical removal of the breast). For patients who will have breast reconstruction using implants, the surgeon may use a breast implant alone, or both a breast implant and ADM. The FDA has not cleared or approved ADM or mesh for use in breast reconstruction. The FDA is informing health care providers and patients of our recent analysis, and requesting prompt reporting of adverse events to help us better understand the risks.

Recommendations for Patients and Caregivers

- Before surgery, discuss with your doctor the risks and benefits of implant-based breast reconstruction with or without ADM use. If ADM will be used, have a discussion with your provider about the type of ADM.
- Be aware that although ADM is used for other types of reconstruction, the FDA has not cleared or approved ADM for use in breast reconstruction.
- If you have had breast reconstruction with ADM and experienced a problem, the FDA encourages you to file a report through MedWatch, the FDA Safety Information and Adverse Event Reporting program (<https://www.fda.gov/safety/reporting-serious-problems-fda/reporting-health-professionals>).

Recommendations for Health Care Providers

- Discuss the potential benefits and risks of all relevant treatment options with your patients as part of a shared decision-making process (<https://www.fda.gov/medical-devices/implants-and-prosthetics/breast-implants>).
- Be aware that the FDA has not approved or cleared any ADM products for use in implant-based breast reconstruction. Data analyzed by the FDA and published literature suggest that some ADMs may have higher risk profiles than others.

- Be aware that the FDA does not recommend reoperation or removal of implanted ADM as a preventive measure.
- Report any patient adverse events to the FDA MedWatch program, using the information in the Reporting Problems with Your Device (<https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems>)page.

Device Description

Acellular Dermal Matrix (ADM), a type of surgical mesh, is developed from human skin (such as FlexHD, AlloMax, AlloDerm) or animal skin (such as SurgiMend), in which the cells are removed and the support structure is left in place. Some ADMs have been cleared by the FDA for use in certain types of surgeries, such as in hernia surgery, to reinforce tissue where weakness exists.

ADMs vary significantly in their source, processing, level of sterility, biomechanical properties, thickness, final product state, and preparation methods prior to clinical application.

Use of ADM in Implant-based Breast Reconstruction

Over the past several years, the use of ADM has increased and is now commonly used off-label in implant-based breast reconstruction. The FDA has not cleared or approved any ADM product for use in breast reconstruction.

The FDA's Analysis of Current Data

Recently, the FDA has completed an analysis of patient-level data from real-world use of ADMs for implant-based breast reconstruction which suggests that two ADMs—FlexHD and Allomax—may have a higher risk profile than others. Mastectomy Reconstruction Outcomes Consortium (MROC) is a prospective, cohort study collecting data from 11 centers, including nine academic hospitals, in the United States and Canada with high volumes of breast reconstruction^{1,2}. The purpose of this study was to evaluate outcomes in patients undergoing implant-based breast reconstruction after mastectomy. The study collected data on major complications including reoperation, explantation (implant removal), and infections. The FDA conducted an analysis on this data set comparing the complication rates between the control group which did not receive ADM and groups receiving one of the four ADM brands (FlexHD, AlloMax, SurgiMend and AlloDerm).

The FDA's analysis of the MROC Study data showed significantly higher major complication rates of explantation, reoperation, and infections in patients with FlexHD and AlloMax brands of ADM two years after surgery, when compared to patients who received SurgiMend or AlloDerm brands, or no ADM. This increase in complications associated with FlexHD or

AlloMax was seen across multiple sites. The limitations from the MROC study and the FDA's analysis to attribute such increase to the specific ADM brands include non-randomized study design, potential differences in institutional or surgeon practices, and different sizes of the cohorts. Additionally, the FDA analysis was limited to immediate, two-stage, under-the-muscle, implant-based reconstruction with up to two-year follow-up.

In addition, multiple peer-reviewed publications in the medical literature also suggest there are differences in safety profiles among different brands of ADM consistent with the FDA's analysis of the MROC Study data³⁻⁶. Additional clinical data are needed to better assess the benefits and risks of ADMs used in implant-based breast reconstruction.

Physicians should be aware that real-world data suggests some ADMs may have higher risk profiles than others. The FDA does not recommend preventive reoperation or removal of implanted ADM. In addition, the FDA is not aware of any information that shows an association between ADM use and development of breast implant associated anaplastic large cell lymphoma (BIA-ALCL).

At this time, the root cause of the difference in complication rates among different brands of ADM is not known, but health care providers and patients should be aware of the FDA's analysis. Prompt reporting of adverse events can help the FDA better understand the risks.

FDA Activities

In March 2019, the FDA held an Advisory Committee meeting on breast implants, at which time the panel noted that while there is data about ADM for breast reconstruction, the FDA has not yet determined the safety and effectiveness of ADM use for breast reconstruction. The panel recommended that patients are informed about this and also recommended studies to assess the benefit and risk of ADM use in breast reconstruction.

The FDA continues to actively work with experts in the clinical and scientific communities and other external stakeholders, including the manufacturers, to evaluate all available information about ADMs. The FDA continues to monitor reports and will keep the public informed if significant new information becomes available. The FDA intends to hold a public meeting of the General and Plastic Surgery Devices Panel of our Medical Devices Advisory Committee in the coming months to promote discussion of currently available scientific information on ADM for breast reconstruction.

Reporting Problems to the FDA

Prompt reporting of adverse events can help the FDA identify and better understand the risks associated with medical devices. If you experience a problem with your device, the FDA encourages you to report the problem through the MedWatch Voluntary Reporting Form

(<https://www.accessdata.fda.gov/scripts/medwatch/index.cfm?action=reporting.home>). Please include device identifiers including brand name, model number, manufacturer, and detailed description of the problem.

Health care professionals employed by facilities that are subject to the FDA's user facility reporting requirements (<https://www.fda.gov/medical-devices/postmarket-requirements-devices/mandatory-reporting-requirements-manufacturers-importers-and-device-user-facilities>) should follow the reporting procedures established by their facilities.

Hospitals are required to report some adverse events related to medical devices. Federal regulations require user facilities to report a suspected medical device-related death to both the FDA and the manufacturer. User facilities must also report a medical device-related serious injury to the manufacturer or to the FDA, if the medical device manufacturer is unknown.

Publications

1. Sorokin, M., et al. "Acellular Dermal Matrix in Immediate Expander/Implant Breast Reconstruction: A Multicenter Assessment of Risks and Benefits." *Plast Reconstr Surg.* 2017 Dec; 140(6): 1091-1100
2. Ganesh Kumar, N., et al. "Development of an evidence-based approach to the use of acellular dermal matrix in immediate expander-implant-based breast reconstruction." *J Plast Reconstr Aesthet Surg.* 2021 Jan;74(1):30-40.
3. Liu, D. Z., et al. "Comparison of outcomes using AlloDerm versus FlexHD for implant-based breast reconstruction." *Ann Plast Surg.* 2014 May; 72(5): 503-507.
4. Michelotti, B. F., et al. "Analysis of clinically significant seroma formation in breast reconstruction using acellular dermal grafts." *Ann Plast Surg.* 2013 Sept; 71(3): 274-277.
5. Ranganathan, K., et al. "Use of Acellular Dermal Matrix in Postmastectomy Breast Reconstruction: Are All Acellular Dermal Matrices Created Equal?" *Plast Reconstr Surg.* 2015 Oct; 136(4): 647-653.
6. Martin, J. B., et al. "Use of Fenestrations in Acellular Dermal Allograft in Two-Stage Tissue Expander/Implant Breast Reconstruction." *Plast Reconstr Surg.* 2014 Nov; 134 (5): 901-904.

Contact Information

If you have questions about this communication, please contact CDRH's Division of Industry Communication and Education (DICE) at DICE@FDA.HHS.GOV (<mailto:DICE@FDA.HHS.GOV>), 800-638-2041, or 301-796-7100.