

Acellular Dermal Matrices in Surgery

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The emergence of acellular dermal matrices has modified the practice patterns of many surgeons in many surgical specialties. Surgical problems that for many years lacked simple surgical solutions are now managed with relative simplicity because of improved techniques and also because of acellular dermal matrices. The success of matrices in surgery has led to an explosion in the marketplace, because there now exists a plethora of biologic tissue matrices for surgeons to choose from. This has led to confusion as to how these materials differ, how the materials behave, which materials to use, and what the long-term benefits are.

The original concept of this supplement was to gather experts in the field of plastic surgery and try to clear up some of the confusion by consolidating white papers and evidence on their use, indications, contraindications, and outcomes. It quickly became apparent that a broader scope that encompassed all of surgery would be useful to the reader, especially as we are increasingly working as part of multidisciplinary teams to treat both simple and complicated defects of all areas of the body. With that in mind, experts, surgeons, and scientists were asked to compile the evidence and report it in a dispassionate way. Knowing that we did not want to lose the practical utility of the supplement, a new concept was born: “Focus on Technique” articles that would exemplify the utilization of principles and marry that with technical execution pearls. The result was this supplement for your review. It provides an up-to-date, evidence-based, thorough, and comprehensive view and review of the use of acellular dermal matrices in surgery. It should serve as a “one-stop shop” for the practicing surgeon on this topic and was carefully constructed along these lines.

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The supplement is organized along two axes. The first is defined by outlining principles, concepts, and fundamentals and then segueing into topics. The second axis is structured by head-to-toe body regions, beginning with the head and neck, proceeding to the chest, breast, and abdomen, and then to wound healing and upper and lower extremity reconstruction.

The first article, “The Biology of Biologics,” by Drs. Novitsky and Rosen, two eminent herniologists and scientists in general surgery, helps define what we know and what we do not know about these materials, including what makes a difference, what does not, and why. It incorporates comparative effectiveness data where they exist and outlines future directions. This is followed by a primer on cross-linking, a fundamental concept in the world of biologics, and it begs the question, is cross-linking good or bad? Finally, the use of acellular dermal matrices in irradiated fields is examined by Drs. Clemens and Kronowitz, including a look at evidence, data, and outcomes.

Following this is the systems-based organization of the supplement, starting with Shridharani and Tufaro’s outstanding systematic review of the use of acellular dermal matrices in head and neck surgery. This is followed by the Breast section, with topics on the use of acellular dermal matrices in primary and secondary breast surgery (both aesthetic and reconstructive), as well as a landmark article out of Memorial Sloan-Kettering on their preliminary findings in a multicenter prospective trial on acellular dermal matrix versus total muscle

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coverage in breast reconstruction—an article presented in 2011 at the American Society of Plastic Surgeons meeting in Denver that was met with critical praise. Several “Focus on Technique” articles follow that have been prepared by experts in the field, namely, Drs. Spear, Salzberg, and Kim and their colleagues. These articles outline the different approaches of one- versus two-stage breast reconstructions using acellular dermal matrices. This is supplemented with clinical photographs and videos to make it user-friendly, practical, and useful. The section finishes up with a review of evidence on capsular contracture and acellular dermal matrices, a hot topic, and finally on complications associated with acellular dermal matrices in breast surgery, just to be sure we evaluate this issue from all angles.

The next section is on the use of acellular dermal matrix for thoracic and abdominal wall reconstruction. Several authors have reviewed both the existing evidence and their experience on these topics, with important discussions from the likes of Heniford and Dumanian. The articles in this section touch on indications and techniques as well as on the importance of defect size reduction, the complexities associated with contaminated fields, and outcomes. What you will find

is that we have evolved our understanding of the use of acellular dermal matrices in this field, but there is yet much more to learn. Preliminary results are promising, but future studies are needed to define standards of care.

The final three articles touch on the role of acellular dermal matrices in wound healing, particularly lower extremity wounds, by world expert Dr. Attinger and his colleagues; in urogynecologic reconstruction, by Drs. Yuteri-Kaplan and Gutman; and finally in hand surgery, by Ellis and Kulber. We hope these comprehensive, data-based reviews will clarify the current state of affairs on the use of biologic scaffold and extracellular matrices in the stimulation of wound closure and reconstruction in these regions.

In sum, the goal of this supplement is to debunk myths, clarify evidence, and provide the reader with useful information on concepts through technique to outcomes. In this regard, we hope that it hits its mark, and we present it to you for your review.

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