Outcomes of Acellular Dermal Matrix for Immediate Tissue Expander Reconstruction With Radiotherapy

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Purpose: Despite increasing literature support for the use of acellular dermal matrix (ADM) in expander based breast reconstruction, its effect on clinical outcomes in the presence of radiation therapy (RT) has not been well described.
Methods: A retrospective review of a prospectively maintained database was performed of consecutive patients who underwent immediate tissue expander (ITE) breast reconstruction from 2004 to present at the University of Texas M.D. Anderson Cancer Center. Patients were categorized into four cohorts: acellular dermal matrix (ADM), ADM with radiation therapy (RT), total muscle coverage (TMC) with RT, TMC without RT. Indications, comorbidities, surgical technique, and complications were evaluated. Primary outcomes included: explantation, seroma, infection, skin necrosis, and delayed wound healing. Univariate and multivariate regression models were used to analyze for potential confounding variables.
Results: 1376 patients underwent ITE reconstruction. 683 patients non-ADM, 113 non-ADM with RT, 486 ADM, and 88 ADM with RT. Overall complication rate between ADM and TMC cohorts were 39% and 16.7% respectively ($p < 0.001$). Within both cohorts, mastectomy skin necrosis was the most common complication, followed by infection. Infections occurred more frequently, and were more severe within the ADM cohort (11.5% and 15.9 versus 3.7% and 11.5%, $p < 0.001$). Incidence of seroma tended to be higher in the ADM cohort and highest within patients that did receive RT when compared to non-ADM (13.6 %versus 10.9% $p > 0.001$). Incidence of explantation was highest in the no-ADM group overall, and highest in non-ADM with RT when compared to the ADM group (20.4% vs11.4%, $p = 0.0012$).
Conclusions: While overall complication rate, as well as incidence of infection and seroma appears to be higher in the patients undergoing ITE with ADM and RT; if recognized and appropriately treated the expander reconstruction is often salvaged. In fact, the use of ADM, appears to play a protective role in preventing the need for re-operations and potentially explantations in patients undergoing RT.