

Application and Management of Cultured Epithelial Autografts (CEAs) on Posterior Burns – A 5-year, Multi-center, Retrospective Review of Outcomes

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Abstract

Introduction: In patients with larger burns, treatment with CEAs have proven to increase survival.¹ CEAs, while useful have some disadvantages. If the injury involves burns to posterior surfaces, these fragile sheets are easily sheared, and pressure can cause graft loss. CEA grafting must be managed with specific care and with specialized protocols that help prevent these complications. Graft loss delays healing, increases hospital length of stay and cost of care. The purpose of this study is to evaluate the success of graft ‘take’ in patients with posterior burns treated with CEA and to discuss the techniques, protocols and approaches to managing these patients within our burn network.

Methods: This retrospective study was granted exemption by IntegReview IRB. Basic demographic data was reviewed. As with many retrospective chart reviews, gaps were found in the electronic medical record (EMR) documentation. Specifically, engraftment rate for each application of CEA was not always found. Therefore, we adapted the “clinically relevant” assessment, used by other authors, that engraftment was considered successful when re-grafting was not required by the time of discharge or death.

Results: Study data was collected from the dates of March 2016 through December 2019 and at this time, is being reported from among three of six participating centers. Our approach to CEA application is standardized throughout our system. Prior to application of CEA, the burn wounds undergo CEA prep. This prep entails final wound excision, surveillance cultures, and obtain proper hemostasis. The CEA prep allows us to maximize our application of CEA on that day and direct our antibiotic therapy. We also standardize our post-op care. Patients remain supine and are placed in soaks based on cultures. They are left intact and rotated side to side, based on a specific protocol we have developed. We do not prone these patients. Total number of patients considered was 68, 40 were deemed evaluable and 38 of those were treated in our center in Augusta, GA. Other demographics were as follows: Age: (Range 4-71) Mean 38, Median 34, Mode 62 Gender: 13 Female (33%) and 27 Male (68%) TBSA: (Range

30-95%), Mean 56%, Median 55%, Burn Etiology: 34 Thermal (83%), 5 Scald (12%), 1 Chemical (2.4%) and 1 Electrical (2.4%). A total of 31 patients met our criteria for successful take (78%). In order to determine the length of time to "take", we posited that if no further surgery was performed after takedown and the progress notes did not indicate ongoing issues or problems, then days to "take" could be considered from the date of CEA placement to the date of initial takedown. For this group of patients that did not require further surgery, days to take was an average of 12 (Range 9-23). Of note, 4 of these patients did have documentation related to "non-adherence", however, take rate for these patients was clearly documented and all were 70% covered or greater without the need for further surgery. A second group of patients (n=5) were re-grafted, but with a second CEA application. We analyzed these patients separately as they had successful take rate after the second CEA application and their average days to take was 11 (Range 9-12). There were 4 deaths and of these, 2 had successful take of CEA and 2 did not. There was only 1 documented case of infection. Thirty-one patients were discharged to rehab (75%), 6 were discharged home (15%) and 4 died (10%).

Conclusions: CEA used on large posterior surface burns is successful in 78% of patients with 1 application. A further 12% succeed after a second application. Mortality was limited to 10% in this cohort. In order to achieve these results there needs to be meticulous wound bed prep and multidisciplinary approach.

Learning Objectives

- 1) To discuss surgical and post-op care and techniques for managing patients with large burns who receive CEAs on the posterior torso.
- 2) To demonstrate the success rate of patients that have received CEAs on the posterior torso.

References:

- 1) Kym, D., et.al. The application of cultured epithelial autografts improves survival in burns. *Wound Repair and Regeneration*. 2015, 23:340-344.
- 2) Carsin, J., et.al. Cultured epithelial autografts in extensive burn coverage of severely traumatized patients: a five year single-center experience with 30 patients. *BURNS*. 2000, 26:379-387.