Acellular Dermal Matrix Reconstruction of the Head and Neck: A Versatile Reconstructive Option

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ABSTRACT

INTRODUCTION

Ablative procedures of the head and neck often result in significant facial and neck contour deformities. Acellular dermatome matrixes (ADM) are gaining popularity for reconstructive applications due to their unique qualities of biocompatibility, bulk, and incompressibility. ADMs have been successfully used to reconstruct defects resulting from ablative oncologic surgery. The purpose of this study was to determine if the expanded use of ADM as a reconstructive modality would have an associated increase in complications that would necessitate surgical intervention, thereby causing increased morbidity for the patient and increased healthcare costs. Additional analysis was performed to determine if tobacco smoking, diabetes mellitus, or hypertension within the analyzed patient population was associated with increased postoperative complications due to their known deleterious effect on wound healing and their potential to inhibit graft revascularization.

METHODS

The medical records of all patients who underwent ADM reconstruction of head and neck defects with AlloDerm by a single surgeon at Vanderbilt University Medical Center from January 2000 to August 2009 were reviewed. Patients were identified following the study reviewed follow-up greater than 5 months. These records were manually reviewed and the data that was collected by the authors and entered into a computerized database. Data recorded include age, sex, presence of vascular co-morbidities, smoking status, incidence of diabetes, date of procedure, location of necrosis, final pathologic classification of the necrotized area, and any associated complications after the procedure. For the purposes of this study, complications were defined as any outcome that required procedural intervention following ADM reconstruction. The patient population underwent ADM reconstruction for a variety of conditions known to have undergone ADM reconstruction, 230 met the inclusion criteria.

RESULTS

The majority of otolaryngology literature discussing ADMs describes a superficial array of ADM on the parotid surgical bed as an interpositional barrier to prevent Frey's Syndrome. There is little in the literature that emphasizes the versatility of ADM reconstruction. Of 265 patients identified having undergone ADM reconstruction, 230 met the inclusion criteria. Two patients of the 77 patients who underwent ADM reconstruction after parotidectomy reported gustatory sweating (2.6%). There were no complications attributed to smoking, diabetes, or vascular co-morbidities.

CONCLUSIONS

Cosmetic defects secondary to significant tissue volume loss in head and neck oncologic surgery is a significant problem that must not be overlooked. ADM has been used to repair volume defects of various size after head and neck oncologic surgery, but discussion of the versatility of the graft and the confirmation of its benefits in various other head and neck anatomic locations is lacking. ADM has been used in the repair of recurrent squamous cell carcinoma, reconstruction of the oral commissure, and reconstruction of head and neck defects following Mohs surgery. Our study confirmed and extended the benefits of ADM reconstruction in post-ablative head and neck defects. ADMs are an excellent head and neck reconstructive option with regard to restoring form and function to the premorbid state, and result in few complications. Moreover, we believe that these results support future studies to examine the potential for ADM to be used in a variety of locations for post-ablative oncologic head and neck defects beyond parotid bed defects. This study is important as a benchmark for determining the safety, success, integration, and low complication rate that make ADM an ideal reconstructive technique.

REFERENCES

Ablative procedures of the head and neck result in significant facial and neck contour deformities. Ablative dermatome matrixes (ADM) are gaining popularity for reconstructive applications due to their unique qualities of biocompatibility, bulk, and incompressibility. ADMs have been successfully used to reconstruct defects resulting from ablative oncologic surgery. The purpose of this study was to determine if the expanded use of ADM as a reconstructive modality would have an associated increase in complications that would necessitate surgical intervention, thereby causing increased morbidity for the patient and increased healthcare costs. The purpose of this study was to determine if the expanded use of ADM as a reconstructive modality would have an associated increase in complications that would necessitate surgical intervention, thereby causing increased morbidity for the patient and increased healthcare costs. Additional analysis was performed to determine if tobacco smoking, diabetes mellitus, or hypertension within the analyzed patient population was associated with increased postoperative complications due to their known deleterious effect on wound healing and their potential to inhibit graft revascularization.

METHODS (continued)

ADM reconstruction to recreate the bulk of strap muscles in the neck and the presurgical anatomical shape and symmetry. ADM was used to accomplish two structures as an interpositional barrier in the prevention of Frey's Syndrome. Laryngoscope. 2001 Nov;111(11 pt 1): 1993-8.

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RESULTS (continued)

Figure 1. Inclusion of AlloDerm use for each location. Note: Several patients had more than one defect with AlloDerm reconstruction in more than one location.

Figure 2. (A) Contouring of ADM graft immediately after placement. (B) Resection of the post auricular and submental skin to improve the shape and volume of auricular reconstruction. (C) Removal of skin from the postauricular skin to improve the shape and volume of auricular reconstruction.

Figure 3. (A) Deep lobe parotid mass. (B) Status post deep lobe mass excision and reconstruction. (C) AlloDerm customization.

Figure 4. (A) Pre-op showing recurrent squamous cell carcinoma of the tongue. (B) Status post resection of left clavicular mass.

Figure 5. ADM reconstruction to recreate the bulk of strap muscles in the neck and the presurgical anatomical shape and symmetry.