Comparison of Non-augmented versus Augmented Double-Row Rotator Cuff Repair with a Bioinductive Collagen Implant versus Acellular Dermal Allograft

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Introduction: Various products have been used to augment primary rotator cuff repair using an onlay technique that demonstrate improved healing rates and outcomes compared to repair alone. The aim of this study was to examine healing rates of rotator cuff tears treated with primary double-row repair with and without augmentation using a bioinductive collagen implant (CI) or acellular dermal allograft (DA).

Material and Methods: Patients undergoing primary arthroscopic rotator cuff repair were prospectively enrolled at a single institution. Patient demographics, past medical history, rotator cuff tear size (small, medium, large, or massive), and preoperative Goutallier classification were recorded. The control group was double-row repairs without augmentation. The augmented groups included repairs using onlay augmentation with either CI or DA. Between 6-12 months postoperatively, patients received MRI testing to assess healing using the Sugaya classification. Patient reported outcomes (PROs), including SANE, ASES, and VAS, were collected at 3-month, 6-month, and >1 year follow-up. Univariate analysis using Chi square was performed to assess differences in healing between treatment groups. PROs were compared utilizing one-way ANOVA. Statistical significance was determined to be a p value < 0.05.

Results: There are 110 patients with follow-up imaging (40 control, 39 CI, 31 DA). The overall healing rate was 65%, with rates similar for control (58%), CI (77%), and DA (58%). There was no significant difference in healing rate between patients with cardiac history compared to those without ($p= 0.089$). Healing rates were similar in control, CI, and DA groups for small, medium, and large sized tears (n=85). In massive tears (n=25), healing was significantly greater for CI (60%) compared to control (0%) and DA (38%) ($p=0.04$). In tears with preoperative Goutallier stage ≤ 1 (n=96), healing was greater for CI (85%) compared to control (59%) and DA (68%) but not statistically significant [Figure 1]. No significant differences were found for those with a Goutallier stage >1 (n=14; control 33%, CI 20%, DA 17%). There were no differences in PROs between groups at 1-year follow-up.

Discussion: Onlay augmentation of a double-row rotator cuff repair with the CI demonstrated an increased healing rate compared to non-augmented repairs and DA augmentation in patients with minimal fatty infiltration and in those with massive tears.
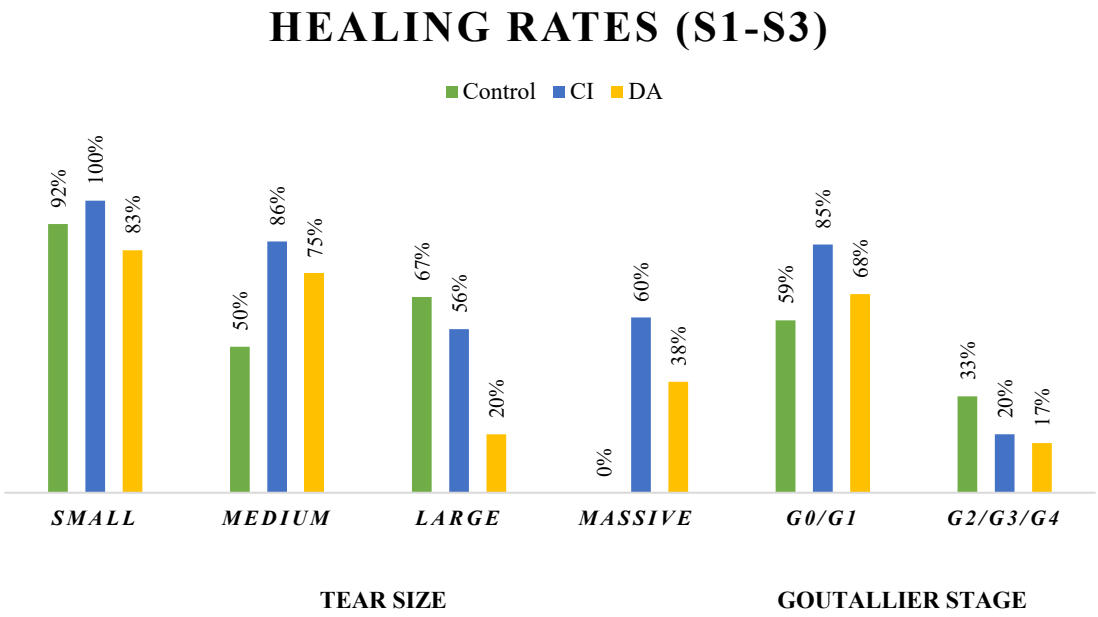
FIGURE 1: Healing Rates by Tear Size and Goutallier Stage