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Two-Year Outcomes Following Biologic Patch Augmentation for the Treatment of Massive Rotator Cuff Tears

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Summary:
The purpose of this study was to assess minimum two-year outcomes after biologic patch augmentation in patients with massive rotator cuff tears.

Abstract:
BACKGROUND Surgical techniques for the repair of rotator cuff tears have improved dramatically over the past decade. However, the management of massive tears with poor tendon quality remains a challenging problem for the treating surgeon. Recently, the use of acellular human dermal biologic patch augmentation has been proposed as a potential solution due to favorable biomechanical properties and theoretical enhanced tissue regeneration capacity. Reports of clinical outcomes following patch augmentation have been limited. Therefore, the purpose of this study was to assess minimum two-year outcomes after biologic patch augmentation in patients with massive rotator cuff tears. METHODS This study was IRB-approved. Surgical indications for patch augmentation surgery were the presence of a massive cuff tear with sufficient tendon quality to allow for: (1) fixation of the native rotator cuff tendon to the medial footprint on the greater tuberosity and (2) fixation of the allograft patch to the remaining cuff tissue. Between April 2008 and June 2011, 21 shoulders with massive rotator cuff tears were repaired using a bridging double row technique and augmented with acellular dermal patches composed of collagen matrix with impregnated growth factors, glycosaminoglycans and proteoglycans. Demographic and surgical data along with pre- and postoperative outcomes scores including ASES, SF- 12 PCS, QuickDASH, and SANE scores were collected prospectively and retrospectively analyzed. Data regarding patient satisfaction and revision surgeries were also collected postoperatively. Failure of patch augmentation occurred when a patient underwent further surgical treatment for rotator cuff insufficiency, including reverse total shoulder arthroplasty (rTSA). Survivorship at 24 months was calculated using the Kaplan-Meier method. For statistical analyses, level of significance was set at $p<0.05$. RESULTS Twenty-one rotator cuff patch augmentation procedures were performed in 5 women and 15 men (one bilateral) with a mean age of 58 years (range 47-68 years). Seventeen of the 21 procedures (81.0%) were revisions of a previous cuff repair. Four of the 21 cuff repairs (19.0%) were revised a mean of 2.6 years postoperatively (range 2.8 months-2.5 years). One shoulder underwent a rTSA 3 months after the patch repair and 3 shoulders underwent revision rotator cuff repair at a mean of 13 months postoperatively (range 5- 25 months). For those that did not undergo revision surgery, mean follow-up was 2.8 years (range 2.0-4.7 years). Follow-up was obtained in 15 of the remaining 17 shoulders (88.2%). Survivorship was 82.6% at 24 months. Mean ASES significantly improved from 59 points prior to surgery to 85 points postoperatively ($p<0.05$). Mean SF-12 PCS, QuickDASH and SANE outcomes scores also all demonstrated significant improvements over their preoperative baselines ($p<0.05$). At final follow-up, median patient satisfaction was 10/10 (range, 4-10). CONCLUSION Biologic patch augmentation with human acellular dermal patches was a safe and effective treatment modality for this cohort of patients with massive rotator cuff tears and poor tendon quality. Significant improvements in function and high patient satisfaction were found two years postoperatively with low failure and complication rates.