Outcomes of Arthroscopic Rotator Cuff Repair Augmented with Bioinductive Collagen Patch: A Single-Institution Retrospective Review

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INTRODUCTION: The use of bioinductive implants in surgical management of rotator cuff (RC) pathology is thought to be beneficial by providing collagenous and vascular support during the critical early postoperative phases of healing. Preliminary clinical studies have reported favorable outcomes with these implants in partial and full-thickness RC tears. Other studies have raised concerns about increased risk of postoperative stiffness when these implants are used, which can significantly affect patient outcomes and delay recovery. This study aims to evaluate clinical and patient-reported outcomes (PROs) following arthroscopic rotator cuff repair done with or augmented with a bioinductive collagen patch, with a minimum follow-up of two years.

METHODS: A single-institution retrospective review was conducted on consecutive patients who underwent arthroscopic rotator cuff repair between January 2011 and June 2024 with a minimum of 2-year follow-up. Patients were included if a bioinductive collagen patch was used as part of the surgical repair. A retrospective chart review was utilized to collect data on tear thickness, concomitant procedures, shoulder range of motion (ROM) measurements, occurrence of post-operative stiffness, treatment of stiffness with oral or injected corticosteroids, return to the OR for management of post-operative stiffness, occurrences of rotator cuff re-tear, and need for revision surgery for a re-tear. Post-operative stiffness was defined as decreased ROM or diagnosis of adhesive capsulitis persisting for 6 months or longer after surgery and stiffness requiring treatment. PROs were assessed at a minimum 2-year follow-up using the Tegner activity scale, American Shoulder and Elbow Surgeons Score (ASES), and Single Assessment Numeric Evaluation (SANE). The proportion of patients achieving PASS for ASES and SANE scores was calculated based on previously defined thresholds for arthroscopic rotator cuff repair.

RESULTS:

93 patients, with an average age of 55.03 ± 10.74 years (51.6% male, BMI 28.76 ± 5.27), underwent arthroscopic rotator cuff repair with the use of a bioinductive collagen patch, and were evaluated at an average follow-up of 47.9 ± 16.9 months. Of the 93 rotator cuff tears, 85 (91.4%) were partial-thickness and 8 (8.6%) were full-thickness. Among the partial-thickness tears, 76 (89.4%) were treated with a bioinductive patch alone, while 9 (10.6%) underwent rotator cuff repair augmented with a bioinductive patch. All 8 full-thickness tears (100%) were treated with rotator cuff repair augmented with a bioinductive patch. Concomitant procedures included biceps tenodesis in 38 patients (40.9%) and subacromial decompression in 29 patients (31.2%). 19 patients (20.4%) experienced postoperative stiffness that necessitated treatment or persisted past 6 months. 5 patients (5.4%) required MUA (manipulation under anesthesia) and arthroscopic LOA (lysis of adhesios). 8 patients (8.6%) had stiffness treated with steroid injections within 3 months of initial surgery and 5 patients (5.4%) were prescribed oral steroids. 4 patients (4.3%) experienced re-tear of the initial rotator cuff repair, and 2 patients (2.2%) required a revision repair. Subgroup analyses were conducted for patients who completed PROs (42 patients, 45.2% follow-up). The average ASES score was 89.3 ± 14.0 with 30 (71.4%) achieving PASS. The average SANE score for the injured and contralateral arms were 75.2 ± 24.3 and 75.8 ± 28.2 respectively, with 19 (45%) achieving PASS.

DISCUSSION AND CONCLUSION: Arthroscopic rotator cuff repair of full and partial tears, utilizing a bioinductive collagen patch yielded favorable outcomes, with a notably low incidence of re-tear and postoperative complications. Almost three-quarters of analzyed patients achieved PASS for ASES scores and almost a half achieved PASS for SANE, underscoring the potential of bioinductive collagen augmentation to enhance the durability and clinical success of rotator cuff repairs. However, the use of bioinductive patches is not without complications, as 1 in 5 patients experienced persistent post-operative stiffness that required further intervention. These findings mirror previous literature, which suggests increased rates of post-operative stiffness in cuff repair with addition of a bioinductive patch to the rotator cuff repair construct. Further prospective studies are essential to validate the long-term efficacy and broader applicability of this technique in diverse patient populations.