Postoperative Antifibrotic Effect of Angiotensin Receptor Blockers and Angiotensin-Converting Enzyme Inhibitors Following Primary Arthroscopic Rotator Cuff Repair

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Introduction: Postoperative stiffness following rotator cuff repair has been reported to occur in up to 15% of patients. Angiotensin II receptor blockers (ARB) and angiotensin-converting enzyme inhibitors (ACEI) and have been previously reported to have antifibrotic potential.

Materials & Methods: Patients that underwent primary arthroscopic rotator cuff repair (ARCR) were identified using an insurance claims database. Patients were stratified based on whether or not they received either an ARB or an ACEI within the 90 days following ARCR. Patients without active records, within 90 days before and 1 year after surgery, were excluded from the analysis. The respective non-medication and medication groups were matched according to patient demographics and comorbidities. The rates of laterality matched outcomes, including manipulation under anesthesia (MUA) or lysis of adhesions (LOA), were evaluated within 1 year of surgery.

Results: In matched cohorts, patients on an ARB were less likely to undergo a procedure for postoperative arthrofibrosis within 1 year following their primary ARCR (LOA [OR 0.93, 95% CI 0.87–0.99; p = 0.029]; MUA [OR 0.90, 95% CI 0.84–0.98; p = 0.015]). Additionally, patients on an ACEI were less likely to undergo LOA within 1 year following their primary ARCR (OR 0.92, 95% CI 0.88–0.98; p = 0.005), however there was no difference observed in the MUA outcome (OR 1.04, 95% CI 0.97–1.12; p = 0.28).

Discussion: Overall, this study adds to the growing body of literature indicating that ARBs and ACEIs may have a role in reducing postoperative fibrosis following arthroscopic surgery. These findings provide clinical evidence to support the mechanistic studies that have demonstrated the modulation of postoperative fibrosis, through the attenuation of TGF-β expression via the blockade of the renin angiotensin aldosterone system. Prospective randomized controlled trials are needed to establish causality and determine optimal patient selection and treatment protocols.

Table 1: Postoperative outcomes within 1 year among matched cohorts receiving either ARB or ACE inhibitor therapy within the 90-day postoperative period.

	Odds Ratio (95% CI)	**p-value**
ARBs (n=201,180)		
LOA	0.93 (0.87, 0.99)	0.029*
MUA	0.90 (0.84, 0.98)	0.015*
ACEI (n=284,337)		
LOA	0.92 (0.88, 0.98)	0.005*
MUA	1.04 (0.97, 1.12)	0.278

Note: * indicates statistical significance with $p \leq 0.05$
Abbreviations: ARB = Angiotensin Receptor Blocker, **ACEI** = Angiotensin-Converting Enzyme Inhibitor, **LOA** = Lysis of Adhesions, **MUA** = Manipulation Under Anesthesia