

Suture Augmentation in Medial Ulnar Collateral Ligament Surgery of the Elbow: Systematic Review, Meta Analysis, and Analysis of Author Financial Conflicts of Interest Status

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INTRODUCTION:

Medial ulnar collateral ligament (UCL) reconstruction has been the gold standard for attritional UCL injuries, but recently interest in UCL suture augmentation (SA) to either repair or reconstruction has been increasing. Based on the available literature we intend to see if a biomechanical or clinical difference in procedures exists. We report on a systematic review, meta analysis, and conflict of interest (COI) study on the role of SA for UCL surgery.

METHODS:

We performed a systematic review according to PRISMA guidelines, with 44 studies identified. Sixteen studies (12 biomechanical, four clinical) were selected for inclusion. Of the biomechanical studies, seven compared UCL repair with SA to reconstruction, and five compared UCL reconstruction with SA to reconstruction alone. Biomechanical data of interest included gapping, joint contact pressure, and kinematic stability. Clinical outcomes were time to return to play (RTP) and complications. Meta analysis investigated load to failure and stiffness of both UCL repair and reconstruction with SA compared to reconstruction alone. AAOS disclosure and CMC Open Payment databases were queried for each study's authors for the year of publication and one year prior.

RESULTS:

Biomechanically, UCL repair with SA performs similarly to reconstruction in gapping, joint contact pressure, and rotational stability. UCL reconstruction with SA provides superior gapping, anatomic joint contact pressures, and improved rotational stability. Clinically, four studies reported on UCL repair with SA, with an average RTP rate at equal or higher level of 93% in 7 months postoperatively, with equivalent complication rates to existing UCL literature. Meta-analysis of four studies evaluating UCL repair with SA to repair alone favored the use of SA in load to failure and overall stiffness of construct. ($p < 0.001$, $p < 0.03$, respectively). Six studies comparing UCL repair with SA to reconstruction did not find any differences in load to failure or overall stiffness. ($p = 0.52$, $p = 0.52$, respectively). All 16 studies reviewed had significant financial conflict of interests with the manufacturers of the suture material used in the studies, ranging from \$5,824.55 to \$15,995,778.73, with 15/16 studies receiving royalties and funding for their research.

DISCUSSION AND CONCLUSION:

UCL repair with SA is equivalent to UCL reconstruction alone regarding load to failure and stiffness, as well as gapping, joint pressures, and rotational stability. UCL reconstruction with SA improves construct load to failure, stiffness, gapping, rotational stability, and keeps joint contact pressures at an anatomic level when compared to reconstruction alone. Clinical outcomes of UCL repair with SA show equivalent or better RTP rates compared to reconstruction, with a timeline that is several months faster. Significant COI in all 16 studies make it imperative that orthopaedic surgeons remain vigilant when reviewing

new literature.

