Revision Risk Following Elbow Ulnar Collateral Ligament Surgery: Comparing Repair versus Reconstruction in a National Sample of 1,820 Patients

Nathan Varady[1], Suhas Parise, Kyle Kunze, Christopher Brusalis[2], Riley Joseph Williams[3], David W Altchek[4], Joshua S Dines[2]

[1]Hospital for Special Surgery, [2]Hospital For Special Surgery, [3]Hospital For Special Surgery - Weill Cornell Med, [4]Hosp for Special Surgery

INTRODUCTION: While reconstruction is the historical gold standard surgical treatment of medial ulnar collateral ligament (UCL) injuries of the elbow, there is growing interest in UCL repair as an alternative surgical option. To date, there are no clinical data comparing the risk of revision surgery following UCL reconstruction and repair. Therefore, the purpose of this study was to assess the long-term results of UCL repair and reconstruction in a national sample of patients in the United States. We hypothesized that revision risk would be similar between UCL reconstruction and UCL repair.

METHODS:

This was a retrospective cohort study of young patients (≤35 years old) who underwent primary UCL reconstruction or repair for an isolated medial UCL injury of the elbow from October 2015 through October 2022 in a large national database. Patient demographic data, comorbidities, surgical details, and concomitant ulnar nerve procedures were collected. Time-to-event analyses were used to assess the risk of revision UCL surgery between groups. Two-year complication rates were also assessed.

RESULTS:

In total, 1,820 patients (69.9% reconstruction, 30.1% repair) with an average follow-up of 2.9 years met inclusion criteria (Table 1). The estimated 2-year revision-free survival (95% confidence interval [CI]) was 99.5% (99.1%-99.9%) for UCL reconstruction compared to 97.9% (96.4%-99.3%) for UCL repair (unadjusted Log-rank p=0.032; Figure 1). UCL repair remained associated with an increased risk of revision UCL surgery after adjusting for confounding variables (hazard ratio 2.94, 95% CI 1.07-8.09, p=0.037). Complication rates, including postoperative ulnar neuropathy (13.8% for UCL reconstruction vs. 14.5% for UCL repair, p=0.78), were similar between groups.

DISCUSSION AND CONCLUSION:

UCL repair has emerged as a viable treatment for UCL injuries in certain patients. In this study, we found that UCL repair was associated with a significantly higher risk of revision UCL surgery than UCL reconstruction in a national sample. Importantly, however, overall failure rates were low and complication rates were similar between procedures. These findings support the overall favorable outcomes of UCL repair, while suggesting that further study may be needed to delineate ideal indications for its use.

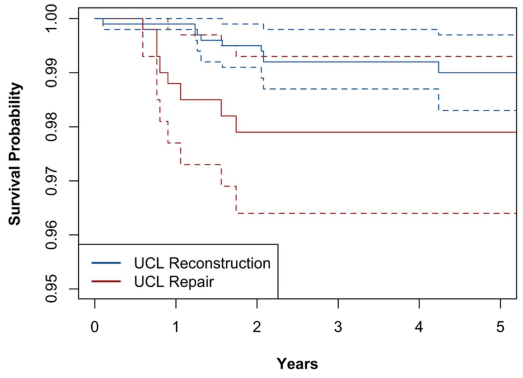

Figure 1. Kaplan-Meier curves with 95% confidence intervals for revision-free survival for ulnar collateral ligament (UCL) reconstruction versus repair.

Table 1. Patient demographics of patients undergoing ulnar collateral ligament (UCL) reconstruction versus repair.

Demographic Breakdown				
Category	Item	UCL Reconstruction (n=1273)	UCL Repair (n=547)	P Value
Age Range	<15	23 (1.8%)	44 (8%)	<0.001
	15 to 19	748 (58.8%)	331 (60.5%)	
	20 to 24	435 (34.2%)	134 (24.5%)	
	25 to 29	33 (2.6%)	17 (3.1%)	
	30 to 35	34 (2.7%)	21 (3.8%)	
	Mean Age	19.24 ± 3.34	18.67 ± 4.16	
Gender	Female	165 (13.0%)	133 (24.3%)	<0.001
	Male	1108 (87.0%)	414 (75.7%)	
Obese		71 (5.6%)	39 (7.1%)	0.83
Smokers		38 (3.0%)	20 (3.7%)	0.94
CCI Scores	0	1020 (80.1%)	441 (80.6%)	0.31
	1	211 (16.6%)	95 (17.4%)	
	2+	42 (3.3%)	11 (2.0%)	
	Mean CCI Score	0.24 ± 0.55	0.22 ± 0.47	
Concomitant Ulnar Nerve Procedure		483 (37.9%)	188 (34.4%)	0.16
Insurance Type	Commercial	1186 (93.2%)	506 (92.5%)	0.80
	Medicaid/Other	87 (6.8%)	41 (7.5%)	
Years	2015	33 (2.6%)	<11 (<2%)	<0.001
	2016	216 (17%)	38 (6.9%)	
	2017	172 (13.5%)	50 (9.1%)	
	2018	154 (12.1%)	76 (13.9%)	
	2019	214 (16.8%)	87 (15.9%)	
	2020	153 (12%)	80 (14.6%)	
	2021	184 (14.5%)	103 (18.8%)	
	2022	147 (11.5%)	107 (19.6%)	

Data reported as mean ± standard deviation or n (%). CCI=Charlson Comorbidity Index.