Is Ulnar-sided Intercarpal Fixation Necessary in Treatment of Perilunate Injuries?

Justin Everett Kleiner[1], William Dotterweich, Andrew B Stein, Michael S Kain[2], Paul Tornetta[1]
[1]Boston University, [2]Boston Medical Center

INTRODUCTION:

Complete perilunate injuries are traditionally treated with reduction and radial sided (scapholunate fixation or scaphoid ORIF) and lunotriquetral fixation to maintain proximal row and midcarpal alignment. However, fixation of the lunotriquetral joint may be difficult and cause malalignment. We hypothesized that there would be no difference in patients with and without ulnar sided fixation. The purpose of this study was to compare the radiographic and clinical outcomes of patients with perilunate injuries treated with radial and ulnar sided fixation with those who had only radial sided fixation.

METHODS: 79 patients treated for perilunate injury at a single level 1 trauma center over a 20 year period were identified. All patients were contacted by telephone and QuickDASH scores were obtained from those available. Radiographs were reviewed for injury type and surgical fixation method. Final radiographs were evaluated for lunotriquetral gap, scapholunate angle, capitolunate angle, and presence of radiocarpal or midcarpal arthritis. Arthritis grading was performed by a board-certified hand surgeon blinded to the ulnar fixation. Continuous variables were compared using Student's T test. Categorical variables were compared using Chi-Square test.

RESULTS: Of the 79 patients included, 32 returned quickDASH scores. 17 of these patients had ulnar-sided fixation, and 15 with radial-only fixation. 29 patents were male, and 3 female. Mean age was 35, with a range of 17-60 years old. Average time from injury to quickDASH measurement was 69 months (range 6-259 months). There were no differences in the demographics of the two groups (p> 0.05, table 1). We found no difference in quickDASH scores for those with (16.7) vs. those without (17.9) ulnar fixation (p=0.86, table 2). We also found no difference in luno-triquetral gap (1.3mm vs 1.6mm; p=0.25), scapho-lunate angle (58° vs 61°; p=0.94), or capito-lunate angle (11.5° vs 7.8°; p=0.65) on followup radiographs after union. 11/32 (46%) patients had radiographic evidence of midcarpal or radiocarpal arthritis at final follow-up; 9/13 (69%) of those with ulnar fixation and 2/11 (18%) without, (p=0.01). No patient developed a VISI deformity. Interestingly, the presence of radiographic arthritis was not associated with a significant increase in quickDASH score (22.7 vs 15.9, p = 0.38).

DISCUSSION AND CONCLUSION: This represents the largest reported series of patients with perilunate injuries treated without ulnar-sided fixation. No difference in functional or radiographic outcome was shown between patients treated with or without ulnar sided fixation. However, patients with ulnar sided fixation were more likely to have radiographic arthritis. These results suggest that isolated radial sided fixation may result in acceptable functional outcomes for patients with perilunate injuries.

Table 1. Demographics of Carpal Instability Patients Treated with and without Ulnar Sided Carpal Pinning

Variable		Ulnar pinning	No Ulnar pinning	P-value
Age		35.3 +- 12.5	34.7 +-13.5	P=0.90
Gender	Male	16 (94%)	13 (87%)	P=0.47
	Female	1 (6%)	2 (13%)	
Injury Type	Perilunate dislocation	5 (29%)	4 (27%)	P=0.47
	Lunate Dislocation	5 (29%)	2 (13%)	
	Trans-scaphoid perilunate dislocation	7 (41%)	9 (60%)	
Time since injury	Less than 5 years	0	9	**P=0.0002**
	5 or more years	17	6	

Table 2. Functional and Radiographic Outcomes of Carpal Instability Patients Treated with and without Ulnar Sided Carpal Pinning

Variable		Ulnar pinning	No Ulnar pinning	P-value
QuickDASH score		16.7 +- 19.3	17.9 +- 17.9	P=0.86
LT Gap		1.3 +- 0.6	1.6 +- 0.4	P=0.25
Arthritis	Yes	8 (62%)	4 (36%)	P =0.22
	No	5 (38%)	7 (64%)	
SL angle	<80 degrees	13 (93%)	10 (91%)	P = 0.85
	>80 degrees	1 (7%)	1 (9%)	
CL angle	< 30 degrees	12 (86%)	11 (100%)	P=0.48
	>30 degrees	2 (14%)	0 (0%)	