

Proximal Row Carpectomy Versus Four Corner Fusion: a Matched Analysis

Ethan Remily, Ruby Gilmor, Gabrielle Nicole Swartz, Reza Morshed Katanbaf¹, Jeremy Dubin², Scott Douglas, Oliver Sax³, Brian Cho, John Victor Ingari

¹Sinai Hospital of Baltimore, ²Sinai Hospital, ³Rubin Institute For Advanced Orthopedics

INTRODUCTION:

Advanced osteoarthritis of the carpus often progresses to disabling pain and dysfunction, preventing patients from performing their daily activities. Such scenarios often require surgical intervention in the form of proximal row carpectomies (PRC) or scaphoidectomy with four-corner fusions (4CF). This current study utilized a large database to examine the demographic characteristics and outcomes of each procedure. We hypothesized there would be no difference in outcomes at one year between each procedure.

METHODS:

A private, all-payer database was queried to collect all patients undergoing either PRC (n=14,043) or 4CF (n=14,602) from 2010 to 2022. Patients were identified utilizing Current Procedural Terminology and International Classification of Diseases, Ninth and Tenth editions codes. Using this cohort, demographics, including gender, age, and various comorbidities were ascertained. Thereafter, the two cohorts were matched, and one-year outcomes on conversion to total wrist arthrodesis and infection were made. Statistical differences between comorbidities and outcomes were analyzed through bivariate analysis.

RESULTS:

Those undergoing PRC were more likely to be female (PRC: 42.55 vs. 4CF: 33.5%). A higher proportion of individuals over the age of 60 underwent PRCs. Nearly every examined comorbidity demonstrated a significant difference, with PRC patients possessing higher proportions compared to 4CFs, except for alcohol abuse. Regarding one-year outcomes, infection rates were significantly higher in 4CF patients (1.08 vs. 1.49%, p=0.021), while conversion to total wrist arthrodesis was significantly higher in 4CF patients (0.96 vs. 1.42%, p=0.004).

DISCUSSION AND CONCLUSION:

Proximal row carpectomy patients were more likely to be female, older, and possess more comorbidities. Four corner fusions exhibited higher rates of postoperative infections and conversions to total wrist arthrodesis compared to proximal row carpectomy.

Table 1: Demographics and Outcomes Between Proximal Row Carpectomy and Scaphoidectomy with Four-Corner Fusions.

Variable	PRC (n=14,043)	4CF (n=14,602)	p-value
Demographics			
<i>Gender</i>			
Male	8,068 (57.45%)	9,704 (66.5%)	
Female	5,975 (42.55%)	4,898 (33.5%)	
<i>Age</i>			
< 40	1,446 (10.30%)	1,810 (12.39%)	
40-49	1,692 (12.05%)	2,005 (13.73%)	
50-59	3,873 (27.58%)	4,225 (28.93%)	
60-69	4,390 (31.26%)	4,400 (30.13%)	
70-79	2,566 (18.27%)	2,265 (15.51%)	
> 80	175 (1.25%)	124 (0.84%)	
<i>Comorbidities</i>			
Alcohol Abuse	1,657 (11.80%)	1,728 (11.83%)	0.9425
COPD	5,282 (37.61%)	5,098 (34.91%)	<0.001
CAD	4,393 (31.28%)	4,097 (28.06%)	<0.001
CHF	1,075 (7.66%)	941 (6.44%)	<0.001
Diabetes	5,652 (40.24%)	5,060 (34.65%)	<0.001
Hypertension	10,535 (75.01%)	10,421 (71.37%)	<0.001
Hypothyroidism	3,409 (24.27%)	3,159 (21.63%)	<0.001
Obesity	6,244 (44.46%)	5,725 (39.20%)	<0.001
Tobacco Abuse	7,413 (52.78%)	7,263 (49.74%)	<0.001
Liver Disease	2,849 (20.29%)	2,818 (19.30%)	0.037
One Year Outcomes (n=11,766 for both)			
Infection	121 (1.08%)	167 (1.49%)	0.021
Conversion to total wrist arthrodesis	107 (0.96%)	160 (1.42%)	0.004

**Values less than 11 redacted to maintain PearlDiver patient confidentiality standards
PRC: proximal row carpectomy, 4CF: four-corner fusion, COPD: chronic obstructive pulmonary disease, CAD: coronary artery disease, CHF: congestive heart failure