

Proximal Row Carpectomy and 4 Corner Fusion in Patients Under 45 Years of Age

Eric R. Wagner, JD Werthel, Bassem T. Elhassan, and Steven L. Moran
 Mayo Clinic, Department of Orthopaedic Surgery
 Rochester, MN

Introduction

Treatment of wrist arthritis in continues to be both challenging and controversial. When the degenerative changes spares the lunate facet, salvage motion sparing procedures are preferred to total wrist fusion. Although many of these motion-preserving procedures, such as proximal row carpectomy (PRC) or four corner fusion (4CF), have been utilized successfully in older low demand patients, there is marked controversy in the younger, high demand patients. In particular, due to the concern for long-term survivability of PRC, as well as some studies suggesting young age to be an important risk factor in PRC, many surgeons avoid performing this procedure in younger, more active patients.

Purpose

The purpose of this study was to examine the long-term survival-free of fusion, complications, radiocapitate (RC) or radiolunate (RL) arthritis, and extremity function in patients under 45 years of age who underwent either PRC or 4CF.

Method

Review of 91 patients who underwent either 4CF (n=51) or PRC (n=52) under the age of 45 years from 1972 to 2008 for the diagnosis of wrist arthritis.

Comparing 4CF and PRC groups, there was similar mean age (34 vs. 32), but fewer laborers (47% vs. 59%) and more males (92% vs. 57%) in the 4CF than the PRC group.

A similar percentage of patients in 4CF and PRC groups underwent selective neurectomy (35% vs. 29%, p=0.72).

Fusion Survival

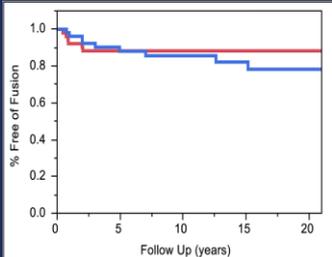


Figure 1. The 5, 10 and 20 year survival rates were 88%, 88%, and 88% for 4CF (red) & 88%, 86%, and 78% for PRC (blue); (p=0.53)

Revision Survival

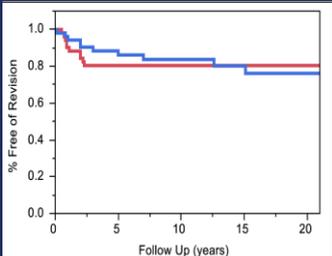


Figure 2. The 5, 10 and 20 year survival rates were 80%, 80%, and 80% for 4CF (red) & 88%, 84%, and 76% for PRC (blue); (p=0.86)

Reoperation Survival

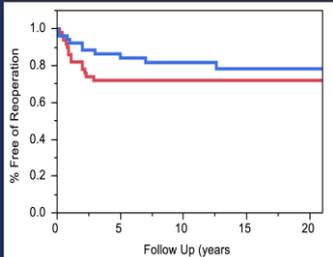


Figure 3. The 5, 10 and 20 year survival rates were 72%, 72%, and 72% for 4CF (red) & 86%, 82%, and 78% for PRC (blue); (p=0.27)

Radiographic Arthritis (mod/sev)

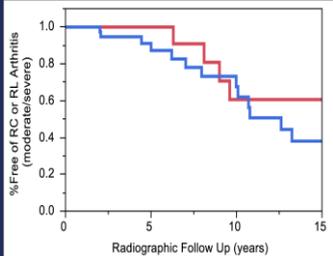
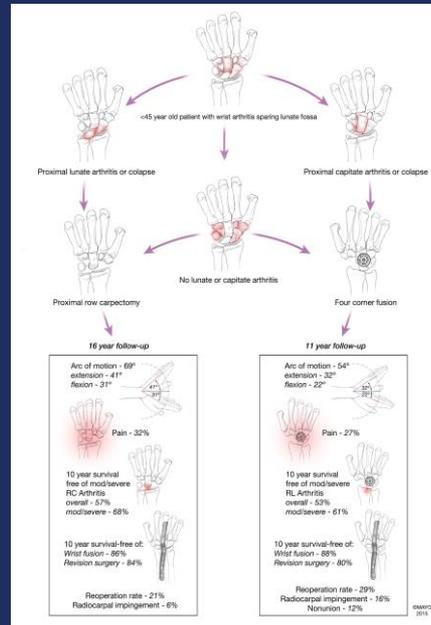


Figure 4. The 5, 10 and 15 year survival rates free of mod-sev arthritis were 100%, 61%, and 61% for 4CF (red) & 87%, 68%, and 38% for PRC (blue); (p=0.50)

Algorithm



Clinical Outcomes

Outcome Measure	Rating	P Value
Pain Relief (% none/mild)	4CF 73	P = 0.64
	PRC 68	
Flexion-Extension Arc	4CF 54° +/-6	P = 0.01
	PRC 69° +/-8	
Radial Deviation	4CF 14° +/-2	P = 0.42
	PRC 13° +/-2	
Ulnar Deviation	4CF 18° +/-3	P = 0.25
	PRC 21° +/-3	
Grip Strength (% of opposite side)	4CF 65 +/-10	P = 0.14
	PRC 55 +/-6	
DASH Scores	4CF 19 +/-3	P < 0.01
	PRC 30 +/-3	
PRWE Scores	4CF 28 +/-4	P = 0.38
	PRC 26 +/-3	

Conclusions

- Both 4CF and PRC represent a good surgical option for young patients with wrist arthritis
- Similar survival-free of fusion, complication rates, pain levels, and wrist function.
- PRC has improved motion, but potentially higher rates of long-term radiocapitate arthritis
 - The rates of radiolunate arthritis after 4CF might be higher than previously thought over the long-term in young patients.