**ABSTRACT TITLE** * Complications following total wrist arthrodesis

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**ABSTRACT** – should include background information and a description of methods, programs, or practices. *

Introduction: This study aimed to investigate the overall complications and the factors associated with major complications after total wrist arthrodesis.

Methods: We retrospectively identified adult patients that underwent total wrist arthrodesis using CPT codes, ICD-9 and ICD-10 and verified these by medical chart review. We included patients (n=218) that were treated at a single institutional system from January 1st 2002 to January 1st 2019. The mean age was 53.3±15.0 years and the median follow-up was 5.3 years (IQR=1.7–9.0). The most common indications for wrist arthrodesis included degenerative arthritis (n=46, 21%), inflammatory arthritis (n=54, 25%) and posttraumatic arthritis (n=39, 18%). All wrist arthrodeses were performed using a dorsal fusion plate or dorsal spanning plate, either with autograft (n=171, 78%), allograft (n=8, 3.7%), a combination of both (n=16, 7.3%) or without graft (n=23, 11%). A major complication was defined as any reoperation, infection or nonunion following wrist arthrodesis. We performed a multivariable logistic regression to evaluate factors associated with major complications.

Results: Seventy-three (34%) patients had a postoperative complication, where soft tissue complications (n=20, 9.1%) were the most common followed by symptomatic implants (n=18, 8.7%), implant failure (n=11, 5.1%) and infection (n=11, 5.1%). Forty-six (21.1%) patients reported a major complication, including 42 reoperations, two nonunions and two infections. Reoperations were performed at a median of 0.6 years (IQR=0.3–1.5) following surgery and the indications included symptomatic hardware (n=14, 33%), implant failure (n=8, 19%) and infection (n=7, 17%). In bivariate analysis, prior wrist surgery was associated with a higher rate of major post–operative complications (14.2% vs 29.6%, p=0.007). Other factors that may play a role in post–operative complications are smoking (p=0.072), wrist arthrodesis on dominant hand (p=0.066), younger age (p=0.087) and the use of 2–3 proximal screws compared to 4 proximal screws (p=0.092). However, we did not have sufficient power to show statistical significance. Additionally, 2.3% of the patients without prior carpal tunnel release were diagnosed with post–operative carpal tunnel syndrome.

Conclusion: Roughly one–third of the patients undergoing wrist arthrodesis experience a post–operative complication, of which 63% are major complications with the majority needing repeat surgery. Prior wrist surgery was associated with major post–operative complications, the soft tissue envelope is often compromised in these patients. Consideration of carpal tunnel release at the time of wrist arthrodesis may be reasonable.