The Impact of Osteoporosis on Outcomes after Open Reduction Internal Fixation for Distal Radius Fractures

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INTRODUCTION: Given the literature demonstrating the negative impacts of osteoporosis on orthopaedic surgery outcomes, we hypothesize that patients with osteoporosis undergoing open reduction and internal fixation (ORIF) for distal radius fractures (DRF) would experience higher rates of adverse events.

METHODS: The New York Statewide Planning and Research Cooperative System was queried by International Classification of Disease 9th Revision (ICD9) codes from 2000 – 2015 to identify all patients who underwent ORIF for DRF. Patients were then stratified by the presence or absence of osteoporosis prior to or at the time of surgery. Univariate analysis compared demographics and the rates of in-hospital mortality, readmissions, and revision surgery at 1 year follow up between cohorts. Multivariate logistic regression was used to identify risk factors for adverse outcomes.

RESULTS:

A total of 12,501 patients were identified, including 952 (7.6%) patients with and 11,549 (92.7%) patients without osteoporosis. Patients with osteoporosis were older (72.4 years vs. 53.9 years), more likely to be female (96.5% vs. 56.4%), white (78.1% vs. 64.3%), and insured by Medicare (67.3% vs. 26.6%) (all p<0.001) [Table 1]. Patients with osteoporosis experienced a longer length of stay (3.1 days vs. 2.7 days, p<0.001), a higher 90-day readmission rate (6.8% vs. 4.7%, p =0.004), and reoperation rate (1.26% vs. 0.62%, p=0.02). Mortality rate was similar between cohorts (0.42% vs. 0.17%, p = 0.09).

Multivariable regression analysis demonstrated that osteoporosis was independently associated with increased risk of mortality (OR: 1.6, 95% CI: 1.4-1.9) as well as revision surgery (OR: 2.9, 95% CI: 1.2-7.1). A diagnosis of osteoporosis was not associated with an increased risk of readmission (OR: 1.2, 95% CI 0.8-1.7) [Table 2].

DISCUSSION AND CONCLUSION: Osteoporosis is a common condition associated with aging, that has been shown to be associated with both increased risk of fractures as well as adverse outcomes after orthopaedic procedures. Furthermore, patients with osteoporosis undergoing ORIF for DRF experienced higher rates of readmission, revision, and mortality than did those without osteoporosis. Osteoporosis was a risk factor for revision and mortality, but not readmission. This study underscores the importance of screening for and management of osteoporosis as well as for robust pre- and perioperative optimization of patients undergoing ORIF.

		Osteoporosis	Non-Osteoporosis	P-Value
Sample Size (n)		952	11,549	-
Age (years)		72.4	53.9	<0.001
Sex	*Male*	3.5%	43.6%	<0.001
	Female	96.5%	56.4%	
Race	*White*	79.0%	64.3%	<0.001
	Black	1.6%	7.9%	
	Hispanic	5.3%	11.3%	
	Other	14.1%	16.5%	

Table 1. Demographics of patients with and without osteoporosis who underwent ORIF for DRF.

	Odds Ratio (OR)	95% Confidence Interval (CI)
Readmission	1.2	0.8 – 1.7
Revision	2.9	1.2 – 7.1
Mortality	1.6	1.4 - 1.9

Table 2. Multivariate regression analysis evaluating the impact of osteoporosis on outcomes after ORIF for DRF.