

# The Impact of Congestive Heart Failure on Outcomes and Complications Following Total Hip Arthroplasty With Minimum 2-Year Surveillance

Jared Newman, Alex Chanki Jung, Ryan Kong, Olivia Christina Tracey<sup>1</sup>, Karanbir Singh, Shuyang Scott Liu, Jaydev B Mistry<sup>2</sup>, Qais Naziri<sup>3</sup>, Aditya V Maheshwari<sup>2</sup>

<sup>1</sup>Department of Orthopaedic Surgery, SUNY Downstate, <sup>2</sup>SUNY Downstate Medical Center, <sup>3</sup>SUNY DOWNSTATE MEDICAL CENTER

**INTRODUCTION:** There is limited literature evaluating the impact of Congestive Heart Failure (CHF) on long-term outcomes after Total Hip Arthroplasty (THA) surgery.

**METHODS:** Using New York State's Statewide Planning and Research Cooperation System, patients admitted from 2009 to 2011 with diagnoses of CHF who underwent THA with a minimum 2-year follow-up surveillance were retrospectively reviewed. A 1:1 propensity score-match (PSM) by age, sex, and obesity status was performed before analyzing data. Univariate analyses evaluated demographics, complications, and subsequent revision. Multivariate binary logistic regression models were also conducted to identify associations between CHF and postoperative outcomes, controlling for sex, age, and obesity status.

**RESULTS:** A total of 3068 propensity score-matched patients were identified (CHF: n=1534; non-CHF: n=1534). Both cohorts were nearly identical in age (CHF: 74.5 years, non-CHF: 74.5 years, p = 0.994), sex (CHF: 55.5% female, non-CHF: 55.5% female, p=0.971), and obesity status (CHF: 17.8%, non-CHF: 17.7%, p=0.962). The CHF cohort, compared to the non-CHF cohort, had fewer white patients (82.5% vs. 90.4%, p<0.001), higher Deyo score (2.47 vs. 0.86, p<0.001), longer length of stay (6.56 days vs. 4.06 days, p<0.001), and higher surgical charges (\$61,696 vs. \$39,147, p<0.001). Rates of surgical and medical complications, and readmission were increased in the CHF group (all, p<0.05) (Table 1). With a 1:1 PSM, patients with CHF, compared to non-CHF patients, had higher independent risk for surgical complications (OR: 1.4 [1.1 – 1.6], p<0.001), wound complications (OR: 1.5 [1.1 – 2.0], p=0.024), and blood transfusions (OR: 1.3 [1.1 – 1.6], p=0.003) 2 years post-operatively. Furthermore, CHF patients had higher independent risk for medical complications (OR: 1.3 [1.1 – 1.6], p=0.002), acute myocardial infarction (OR: 4.1 [2.6 – 6.4], p<0.001), pulmonary complications (OR: 3.3 [1.6 – 6.9], p=0.001), pneumonia (OR: 1.4 [1.1 – 1.8], p=0.006), urinary tract infection (OR: 2.0 [1.1 – 3.5], p=0.019), and acute renal failure (OR: 1.5 [1.2– 1.9], p<0.001) 2 years post-operatively. Post-operative readmission was also greater among CHF patients compared to non-CHF patients (OR: 1.2 [1.0– 1.5], p=0.016).

**DISCUSSION AND CONCLUSION:** Patients with CHF had higher surgical charges, greater length of stay, Deyo score, surgical and medical complications, and readmission rates than a propensity score matched patient cohort without CHF from the general population undergoing total hip arthroplasty. These results can support management of postoperative expectations and concerns in this patient cohort.

Postoperative Outcome	No CHF N (%)	Yes CHF N (%)	P-Value
<b>Surgical Complications</b>	737 (48.0%)	962 (62.7%)	< 0.001
Wound	85 (5.5%)	140 (9.1%)	< 0.001
CNS	3 (0.2%)	4 (0.3%)	0.705
Dural Tear	0 (0.0%)	0 (0.0%)	-
Malunion of Fracture	5 (0.3%)	7 (0.5%)	0.563
Nonunion of Fracture	29 (1.9%)	38 (2.5%)	0.266
Prosthetic implant joint	123 (8.0%)	132 (8.6%)	0.556
Transfusion of blood	685 (44.7%)	895 (58.3%)	< 0.001
<b>Medical Complications</b>	465 (30.3%)	741 (48.3%)	< 0.001
Altered mental status	44 (2.9%)	35 (2.3%)	0.305
Acute myocardial infarction	32 (2.1%)	107 (7.0%)	< 0.001
Pulmonary	11 (0.7%)	42 (2.7%)	< 0.001
Pneumonia	153 (10.0%)	260 (16.9%)	< 0.001
Gastrointestinal	15 (1.0%)	24 (1.6%)	0.147
Urinary tract infection	26 (1.7%)	46 (3.0%)	0.017
Acute renal failure	204 (13.3%)	414 (27.0%)	< 0.001
Sepsis	112 (7.3%)	154 (10.0%)	0.007
Pulmonary embolism	26 (1.7%)	33 (2.2%)	0.357
Deep venous thrombosis	43 (2.8%)	56 (3.7%)	0.184
Cerebrovascular event	97 (6.3%)	113 (7.4%)	0.253
<b>Reoperation</b>	117 (7.6%)	77 (5.0%)	0.003
<b>Revisions</b>	68 (4.4%)	59 (3.8%)	0.415
<b>Readmission</b>	931 (60.7%)	1062 (69.2%)	< 0.001
<b>Mortality (Hospitalization)</b>	72 (4.7%)	142 (9.3%)	< 0.001

**Table 1:** Impact of Congestive Heart Failure on Rate of Postoperative Outcomes in Patients undergoing Total Hip Arthroplasty.