

Revision Rate Following Unipolar vs. Bipolar Hemiarthroplasty

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INTRODUCTION: There has been much debate on use of bipolar or unipolar femoral heads during hemiarthroplasty for the treatment of femoral neck fractures. A recent study from the Australian national registry demonstrated decreased all-cause revisions at long-term follow-up in patients treated with bipolar hemiarthroplasty. No studies have compared the outcomes of these femoral head implant choices in the American Joint Replacement Registry.

METHODS: The American Joint Replacement Registry (AJRR) was utilized to search for all primary femoral neck fractures treated with hemiarthroplasty between January 2012 and June 2020. Inclusion criteria included patients 65 years of age or older in order to maximize outcome capture via merging the AJRR to the Medicare claims database. All cause-revision between unipolar and bipolar hemiarthroplasty was assessed at latest follow up.

RESULTS: There were no differences in all cause revisions between unipolar and bipolar hemiarthroplasty ($p=0.41$). However, a Cox model analysis demonstrated increased revisions for bipolar hemiarthroplasty at a time point of 6-months post-index operation ($P=0.0281$), but an increased risk of revision for unipolar hemiarthroplasty between 2 and 3 years ($P=0.0003$), and after 3-years ($P=0.0085$) (Table 1). An older age ($HR=0.999$, 95% CI 0.998,0.999, $P=0.0006$) and higher Charlson Comorbidity Index ($HR=0.996$, 95% CI 0.992, 0.999, $P=0.0192$) also demonstrated a significant increase in revision risk in a survival curve for proportional hazards assessment.

DISCUSSION AND CONCLUSION: In the early postoperative period, the bipolar group had a significantly higher risk of revision. However, the time dependent interaction indicates that this risk decreased over time, and the bipolar group had a lower risk of revision at later follow-ups. We hypothesize that this is due to decreased overall wear of the native acetabulum, and surgeons should consider using bipolar prosthesis when performing hemiarthroplasty for femoral neck fracture in patients expected to live more than 2 years post-injury.

variable	HR (95% CI)	P value
surgery bipolar vs. unipolar: within first 6 months	1.181(1.018,1.37)	0.0281
surgery bipolar vs. unipolar: between 6 months and 1 year	0.881(0.622,1.246)	0.4731
surgery bipolar vs. unipolar: between 1 and 2 years	0.744(0.546,1.013)	0.0602
surgery bipolar vs. unipolar: between 2 and 3 years	0.402(0.245,0.657)	0.0003
surgery bipolar vs. unipolar: 3 years and after	0.457(0.255,0.819)	0.0085