

Risk for Postoperative Complications Following Hemiarthroplasty for Femoral Neck Fracture in Patients on Warfarin at the Time of Admission

Kristin McPhillips, MD, MPH; Hemil Maniar, MD; Jove Graham, PhD; Daniel Horwitz, MD; Geisinger Hospital, Danville, Pennsylvania, USA

Background/Purpose: Fractures of the femoral neck are a large and growing source of morbidity and mortality in the elderly population. There has been an increase in the number of patients taking warfarin and other blood thinners due to medical comorbidities, but no specific recommendations exist regarding the reversal of anticoagulation of these patients prior to hip fracture surgery. The risk of bleeding is thought to be less if the international normalized ratio (INR) is less than 1.5 at the time of surgery, but this has not been studied in orthopaedic patients. Furthermore, the risks of thromboembolic disease in these patients are unknown. We sought to examine the effect of INR at the time of surgery on the risk of postoperative hematoma or infection and also to describe the risk of thromboembolic disease in these patients.

Methods: This study was an IRB-approved retrospective review of electronic health records from patients who underwent hemiarthroplasty for a femoral neck fracture at two hospitals (a Level I and Level II trauma center in the same health system) between January 2004 and September 2013 and who were taking warfarin and had an INR >1.3 upon admission. INR at admission and at surgery, time from presentation to surgery, estimated blood loss, and the length of surgery were recorded. Diagnosis of hematoma was recorded as well as all other intraoperative complications. The primary outcome was hematoma or deep infection (HDI) requiring reoperation within 60 days.

Results: 91 hips in 88 patients were included in the study. The majority of patients were taking warfarin for atrial fibrillation. Mean INR at admission was 2.49 (range, 1.34-8.20) and the mean time until surgery was 42 hours. Mean INR at the time of surgery was 1.52 (range, 1.05-2.28). There were 7 HDI (5 confirmed infections and 2 noninfected hematomas) that required reoperation within 60 days of the procedure; 6 patients with HDI had INR ≥ 1.5 at the time of surgery, 1 had an INR below 1.5. There were 4 superficial hematomas that did not require reoperation; all had INR above 1.5 at the time of surgery. Two patients with thromboembolic complications having INR below 1.5 died. The mean estimated blood loss was 177 mL for patients with INR <1.5 and 237 mL for patients with INR ≥ 1.5 at time of surgery ($P = 0.02$).

Conclusion: Our data suggest that higher INR at the time of surgery may predispose to increased blood loss, hematoma, and infection, but that more aggressive reversal of anticoagulation may result in increased risk of thromboembolic disease. More data are needed to quantify this risk and to define the optimal pathway for patients on warfarin who present with femoral neck fractures requiring hemiarthroplasty.

INR at Surgery	n	Hematoma, n (%)		Infection, n (%)		Reoperation, n (%)	Any Hematoma or Infection, n (%)
		Deep	Superficial	Deep	Superficial		
<1.4	28	0 (0%)	0 (0%)	0 (0%)	2 (7%)	0 (0%)	2 (7%)
1.4-1.49	17	1 (6%)	0 (0%)	1 (6%)	0 (0%)	1 (6%)	1 (6%)
1.5-1.59	16	1 (6%)	1 (6%)	1 (6%)	0 (0%)	2 (13%)	3 (19%)
1.6-1.69	14	2 (14%)	1 (7%)	2 (14%)	0 (0%)	3 (21%)	4 (28%)
≥1.7	16	1 (6%)	2 (13%)	1 (6%)	1 (6%)	1 (6%)	4 (25%)

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an “off label” use). For full information, refer to page 600.