

**Periprosthetic Fracture Following Arthroplasty for Femoral Neck Fracture: Is a Cemented Stem Protective?**

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**Purpose:** Periprosthetic femoral fractures (PFFs) carry significant morbidity in patients following arthroplasty for femoral neck fracture (FNF). The purpose of this study was to assess fracture complications following arthroplasty for FNF and determine the effect of cement fixation of the femoral component on intraoperative and postoperative PFF. Our null hypothesis was choice of procedure and use of cement would not affect incidence of PFF.

**Methods:** Between February 2014 and September 2021, 740 patients with an FNF who underwent arthroplasty were analyzed for demographics, surgical management, use of cement for fixation of the femoral component, and subsequent PFF. Variables were compared with Mann-Whitney or  $\chi^2$  as appropriate. Multivariate logistic regression was used to assess independent risk factors associated with intraoperative or postoperative PFF.

**Results:** There were 163 total hip arthroplasties (THA; 41% cemented) and 577 hemiarthroplasties (HA; 95% cemented). There were 28 PFFs (3.8%): 18 postoperative and 10 intraoperative. Fewer postoperative PFFs occurred with cemented stems (1.63% vs 6.30%,  $P = 0.002$ ). Mean time from surgery to presentation with postoperative PFF was 14 months (range, 0-45 months). In multivariate regression, use of cement and THA were independently associated with decreased postoperative PFF (cement: odds ratio [OR] 0.112, 95% confidence interval [CI] 0.036-0.352,  $P < 0.001$ ; THA: OR 0.249, 95% CI 0.064-0.961,  $P = 0.044$ ). More intraoperative fractures occurred during THA (3.68% vs 0.69%,  $P = 0.004$ ) and non-cemented procedures (5.51% vs 0.49%,  $P < 0.001$ ). In multivariate regression, use of cement was protective against intraoperative fracture (OR 0.100, 95% CI 0.017-0.571,  $P = 0.010$ ).

**Conclusion:** In patients with an FNF treated with arthroplasty, cementing the femoral component is associated with a lower risk of intraoperative and postoperative PFF. Choice of procedure may be based on patient factors and surgeon preference.

**Table 1: Multivariate Regression for Post-Operative and Intraoperative Periprosthetic Femoral Fracture**

POST-OPERATIVE PERIPROSTHETIC FEMORAL FRACTURE				
	Odds Ratio	Std. Error	P-Value	95% Conf. Interval
THA	0.212	0.165	<b>0.046</b>	0.046 0.973
Use of Cement	0.138	0.086	<b>0.001</b>	0.041 0.466
Age	0.977	0.027	0.408	0.926 1.032
BMI	0.985	0.054	0.780	0.884 1.097
CCI	1.125	0.152	0.382	0.864 1.465
White*	0.729	0.379	0.544	0.263 2.020
Assistive Device	0.707	0.393	0.533	0.238 2.102
Female Gender	1.506	0.836	0.460	0.508 4.471
<i>Adjusted Multivariate</i>				
	Odds Ratio	Std. Error	P-Value	95% Conf. Interval
THA	0.249	0.172	<b>0.044</b>	0.064 0.961
Use of Cement	0.112	0.065	<b>&lt;0.001</b>	0.036 0.352
INTRAOPERATIVE PERIPROSTHETIC FEMORAL FRACTURE				
	Odds Ratio	Std. Error	P-Value	95% Conf. Interval
THA	2.509	2.590	0.373	0.332 18.978
Use of Cement	0.083	0.076	<b>0.007</b>	0.014 0.501
Age	1.026	0.040	0.520	0.949 1.108
BMI	0.971	0.071	0.684	0.842 1.120
CCI	0.978	0.244	0.930	0.600 1.594
White*	0.480	0.338	0.297	0.121 1.904
Assistive Device	2.152	1.877	0.380	0.389 11.897
Female Gender	4.581	4.983	0.162	0.543 38.624
<i>Adjusted Multivariate</i>				
	Odds Ratio	Std. Error	P-Value	95% Conf. Interval
THA	1.296	1.086	0.757	0.251 6.694
Use of Cement	0.100	0.089	<b>0.010</b>	0.017 0.571

\*Race was split into white vs. not-white cohorts as the full patient cohort was majority white.

See the meeting website for complete listing of authors' disclosure information. Schedule and presenters subject to change.