Uncemented Hip Hemi-Arthroplasty is Associated with Increased Fracture Risk and Complications Compared to Cemented Hemi-Arthroplasty

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INTRODUCTION:

Hip hemiarthroplasty (HHA) is the preferred treatment for femoral neck fractures in the elderly. Multiple randomized controlled studies, meta-analyses, and database studies have reported higher rates of intraoperative and postoperative fractures and reoperations with uncemented HHA. However, individual surgeons continue to perform uncemented HHA, and we have specifically noted this in our hospital system. The primary goal of our study was to evaluate our local treatment practices and outcomes and determine if the literature results are consistent within our patient population. So we asked: Is the incidence of intraoperative and postoperative fractures associated with uncemented hip hemi-arthroplasty at our hospital system similar to reported rates in literature?

METHODS:

A retrospective chart review was completed of patients within our hospital system age >50 years who sustained an intracapsular femoral neck fracture (ICD-9 820.00-820.19, ICD-10 S72.000 – S72.099) treated with hemiarthroplasty (CPT 272236) between 2009 and 2017. Primary outcome was the rate of intra-operative and post-operative fractures. Other outcomes included operative time, infection, dislocation, reoperation rates, and mortality. Categorical data were analyzed with a chi-squared and parametric data were analyzed with student t-tests.

RESULTS:

4408 patients met inclusion criteria: 497 treated with cemented HHA (11.3%%) and 3911 uncemented HHA (88.7%). Patients were 69% female, with a mean age of 81 years, and 78% with ASA $\geq$ 3, with no differences between the two groups. The incidence of fractures was significantly higher in the uncemented group compared to the cemented group (7.1% vs. 3%, p=0.001), including intraoperative fractures (2.8% vs. 0.8% , p=0.009), and post-operative fractures (4.3% vs. 2.2% , p=0.025). Total complications trended toward being higher in the uncemented group (10% vs. 9.5%, p=0.058). The mean operative time was 27 minutes longer for the cemented group (1hr 26 min vs 59 mins).

DISCUSSION AND CONCLUSION:

The data from our local hospital system demonstrates a higher rate of fractures with uncemented HHA (3.6 relative risk of intraoperative fractures, and 1.9 relative risk of post-operative fractures), and a higher rate of complications. Despite the expanding knowledge regarding the risks of uncemented HHA, the majority of HHA performed in our hospital system were uncemented (89%). In our opinion, the shorter operative times for uncemented HHA is outweighed by the increased fracture rate in this frail population, with severely negative clinical and economic consequences.

In conclusion, the high percent of uncemented HHA in our institution is associated with a higher rate of fractures that cemented HHA and this is consistent with literature. This study underscores the importance of critical evaluation of evidence and the applicability of literature-guided practices.

Table I: Demographics

	Overall Count (%)	Uncemented HHA Count (%)	Cemented HHA Count (%)	*p* -value
n	4408	3911 (88.7%)	497 (11.3%)	--
Age (mean + SD)	81.1 ± 9.8	81.2 ± 9.5	81 ± 11.3	0.679
Sex				
Male	1389 (31.5%)	1239 (31.7%)	150 (30.2%)	--
Female	3018 (68.5%)	2671 (68.3%)	347 (70.8%)	0.496
ASA >= 3	3385 (76.8%)	3324 (85%)	411 (82.7%)	0.18
Fractures				
Total Fractures	293 (6.6%)	278 (7.1%)	15 (3%)	0.001‡
Intraoperative Fractures	113 (2.6%)	109 (2.8%)	4 (0.8%)	0.009‡
Post-operative Fractures	180 (4.1%)	169 (4.3%)	11 (2.2%)	0.025‡
Time to Fracture	653 days	627 days	857 days	--
Other Complications				
Post-operative Infection	85 (1.9%)	75 (1.9%)	10 (2%)	0.885
Post-operative Dislocation	105 (2.4%)	88 (2.3%)	17 (3.4%)	0.107
Total Complications	483 (11%)	441 (10%)	42 (9.5%)	0.058
Length of Surgery	1hr 2mins	59 mins	1hr 26mins	--

Table I: Significance is indicated by (‡). (HHA) hip hemiarthroplasty; (SD) standard deviation; (ASA) american society of anesthesiolofists classification.