Reviewer's report

Title: Outcomes after Fixation for Undisplaced Femoral Neck Fracture Compared to Hemiarthroplasty for Displaced Femoral Neck Fracture among Elderly

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Reviewer: Gerard Slobogean

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The current study seeks to explore the long-term outcomes and complications after fixation of undisplaced femoral neck fractures using competing risk analysis and data from a national database.

More specifically, the authors performed a case-control design and matched undisplaced fracture cases (internal fixation) to displaced controls (hemiarthroplasty) based on age, gender, comorbidities, and day of surgery. Three outcomes of interest were analyzed: overall mortality, incidence of first surgical complication, incidence of first medical complication.

Overall, this is a well written manuscript with appropriate statistical methods and excellent reporting of their methods and results. I would recommend publication with the few minor revisions below:

1. Add 1-2 sentences on what competing risk analysis is and why it is the most appropriate survival analysis method for the analysis.
   -This is done in the discussion (lines 247-257), but an introduction to the technique and its justification would be beneficial for the reader if it occurs sooner in the methods section

2. Line 182: Whether undisplaced femoral neck fracture should be treated with arthroplasty to decrease the occurrence of postoperative complication?
   -This sentence is awkward and needs editing within the overall paragraph

3. Line 189: Change to mortality “associated with” fixation, not mortality of fixation.

4. Line 273: same comment, change to “mortality associated with fixation”

5. The discussion would benefit from a brief interpretation / hypothesized clinical explanation of why the observed results occurred. i.e., the increased surgical complications in the internal fixation group makes sense because of hardware failure, extreme shortening, AVN. But why is arthroplasty associated with higher short-term mortality? Is this because the surgery is more invasive and this causes peri-operative complications and death?

   A little more discussion to cautiously highlight the clinical significance of the study would make the manuscript more relevant to the readership. I do recognize this is still a database study and one must be careful making causative statements.
-This could be done at the end of Line 192 or elsewhere. Does this information change the author’s practice? Should we be considering a clinical trial comparing fixation vs arthroplasty for undisplaced fractures?

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests