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Commentary on relationship between pre-fracture characteristics and perioperative complications in the elderly hip fracture patient

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Hip fractures in the elderly population are associated with staggeringly high short- and long-term mortality rate that cannot be explained by a fracture alone. Furthermore, functional limitations of survivors can be pronounced.¹ Many issues, including preoperative medical evaluation, timing of surgery, perioperative management of chronic medical problems, deep venous thrombosis prophylaxis, pain, delirium, nutrition, fluid status, and urinary tract management, are essential for the optimal care of these patients.² Given the increased mortality rate associated with delay in surgery, the timely medical optimization both before and after the surgery is paramount, as illustrated in a recent analysis of surgical delay in hip fracture patients.³

To improve clinical outcomes for this vulnerable population of patients, two general approaches have been taken. The first is a co-management model with either hospitalists or geriatricians teamed up with orthopedic surgeons. This model of care has been shown to improve care efficiency and to reduce length of stay without adversely affecting mortality or postoperative complications.^{4,5} While hospitalist/geriatrician's management of above medical conditions presumably lead to better clinical efficacy and patient satisfaction, consistent reduction of mortality rate and morbidity has yet to be seen. The second approach is to identify pre-fracture characteristics and perioperative predictive risk factors for postoperative complications and mortality, which eventually will allow for selective triaging and targeted intervention. In this study, the authors took an important step in examining these characteristics and their results added to the growing list of predictive perioperative risk factors.⁶

Many previous studies have identified pre-operative risk factors such as age, ASA class, pre-fracture functional status, fracture types, and medical comorbidities, for postoperative mortality and morbidity.⁶ Although retrospective in design with limitation to a single institution, the authors identified ASA class as the single most important predictive factor for at least one or more postoperative complications in this cohort of 389 patients. Other predictive factors mentioned above only had predictive values for a specific postoperative complication. Mortality rate was low and therefore no predictive factors were investigated. While ASA class is easy to use at the bedside, it is only a proxy of the patient's medical

comorbidities, and generally lacks consistency and predictive accuracy in a heterogeneous clinical setting.⁷ More established indices such as Charlson comorbidity index or APACHEII, may have more predictive power but are rarely useful at the bedside. Furthermore, several recent studies have identified non-traditional but important predictive risk factors for perioperative complications and mortality such as preoperative anemia,⁸ and the presence of congested heart failure.⁹ From all these studies, it is apparent that no single risk factor is able to predict all postoperative complications and mortality, and a powerful predictive index incorporating multiple risk factors is urgently needed. Two such predictive indices have been described in the literature with reasonable discriminative power and warrant further investigation and external validation.^{10,11}

Hip fracture is one of the geriatric syndromes, and therefore, deserves a comprehensive geriatric assessment and a multidisciplinary approach of care focusing on restoration of functional status and maximizing quality of life. In this regard, the outcome predictive model for a geriatric syndrome will likely need to incorporate both medical comorbidities and functional status. However, the best approach to integrate geriatric principles into hip fracture care has remained unclear. Given the shortage of geriatricians, it is unlikely that an orthopedic-geriatric co-management model will prosper. More likely, hospitalists, internists, and orthopedic surgeons alike will all need to master essential skills of inpatient geriatric care including managements of delirium and dementia, pain, urinary symptoms, palliative care, and geriatric medications.

As the American population ages, hip fractures will substantially increase in prevalence and incidence and negatively affect the utilization of healthcare resources. We must take the perioperative medical management of hip fracture patients to another level, using not only a medicine-orthopedics co-management model, but also an effective risk stratification model to allow appropriate initial triaging, surgical decision making, and level of postoperative monitoring. In this regard, the authors made a valuable effort and their results should lead to future large scale cohort studies to validate these predictive factors, as well as randomized controlled trial to address the effect of intervention. Future predictive indices should incorporate readily available clinical, epidemiologic, and laboratory variables, and should help guide appropriate levels of perioperative care. The best is still yet to come for improving the care of elderly hip fracture patients.

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References

1. Haentjens P, Magaziner J, Colon-Emeric CS, et al. Meta-analysis: excess mortality after hip fracture among older women and men. *Ann Intern Med.* 2010; 152: 380–390. [PubMed: 20231569]
2. Carriero FP, Christmas C. In the clinic: hip fracture. *Ann Intern Med.* 2011, ITC6–2.
3. Vidan MT, Sanchez E, Gracia Y, et al. Causes and effects of surgical delay in patients with hip fracture. *Ann Intern Med.* 2011, 155: 226–233. [PubMed: 21844548]
4. Phy MP, Vanness DJ, Melton III LJ, et al. Effects of a hospitalist model on elderly patients with hip fracture. *Arch Intern Med.* 2005; 165: 796–801. [PubMed: 15824300]

5. Friendman SM, Mendelson DA, Bingham KW, Kates SL. Impacts of a comanaged geriatric fracture center on short-term hip fracture outcomes. *Arch Intern Med.* 2009; 169: 1712–1717. [PubMed: 19822829]
6. This paper in press at SMJ (authors) Relationship between pre-fracture characteristics and perioperative complications in the elderly hip fracture patient. *SMJ* 2012;
7. Owens WD. American society of anesthesiologists physical status classification system is not a risk classification system. *Anesthesiology* 2001; 94: 378.
8. Musallam KM, Tamim HM, Richards T, et al. Preoperative anemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study. *Lancet* 2011; 378: 1396–1407. [PubMed: 21982521]
9. Cullen MW, Gullerud RE, Larson DR, et al. Impact of heart failure on hip fracture outcomes: a population-based study. *Journal of Hospital Medicine* 2011; 6: 507–512. [PubMed: 22042721]
10. Jiang HX, Majumdar SR, Dick DA, et al. Development and validation of a risk score for predicting in-hospital and 1-year mortality in patients with hip fracture. *J Bone Miner Res.* 2005; 20: 494–500. [PubMed: 15746995]
11. Frost SA, Nguyen ND, Black DA, et al. Risk factors for in-hospital post-hip fracture mortality. *Bone* 2011; 49: 553–8. [PubMed: 21689802]