Improving the Management of Hip Fractures in the Elderly

A Role for the Perioperative Surgical Home?

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The accelerating growth in the world’s elderly population is staggering. The U.S. Census Bureau estimates that the world’s population, over 65 yr of age, grew by 870,000 per month in 2008.* By 2018, the world population is projected to have a net monthly gain of 1.9 million people over 65 yr of age. By 2040, more than one of every four Europeans will be at least 65 yr of age, and one in seven will be at least 75 yr old. In 2040, one in five North Americans will be at least 65. Vaupel and Jeune estimate that over the course of human history, the odds of living from birth to age 100 may have risen from 1 in 20 million to 1 in 50 for low mortality nations such as Japan and Sweden.1 Oeppen and Vaupel2 calculate that, if the past 160-yr trends continue for another 60 yr, people in low mortality countries will live an average of 100 yr.

With this increase in the aged population, there is an accompanying increase in prevalence of chronic conditions such as arthritis, cardiac disease, diabetes, hypertension, and obesity. Hip fracture is strongly associated with aging, osteoporosis, and falls. Among the over 99 million adults, 50 yr or older in the United States (in 2010), the prevalence of osteoporosis is estimated at 10.3%.* The lifetime probability of osteoporotic hip fractures, starting at age 50 is 10.7% in Swedish men, and 22.9% in Swedish women.3

In 2010, the annualized rate of nonfatal falls resulting in a visit with a healthcare professional (in the United States) was 43 of 1,000 averaged for all ages and was 115 of 1,000 in those over age 75 yr.4† The 1-yr mortality rate after hip fracture is 20% for elderly females and 26% for elderly males. This excess mortality persists as long as 10 yr after the fracture.5 The 30-day perioperative mortality associated with surgical repair of neck of femur fracture is considerably greater than after primary or revision hip arthroplasty, 10 versus 0.4%, probably due to differences in comorbidity.6,6

In this issue of Anesthesiology, Boddaert et al. review this bone health issue and summarize best practices. They focus on the relatively new subspecialty of orthogeriatric medicine, before speculating on the way ahead to improve care.7,8 While we and others may disagree with whether evidence supports some of their recommendations and conclusions (e.g., nerve blocks being done on arrival to the emergency department or the American Society of Anesthesiologists physical status score being “obsolete”), we endorse their approach to this common and vexing problem.

Moreover, the “orthogeriatric” concept should no longer be considered innovative: coordinated, multidisciplinary care tailored for hip fracture patients has been described in multiple other publications.3–11‡ The established core management of hip fractures includes protocol-driven, fast-track passage through the emergency department, early surgery, and early mobilization. This is not an elective procedure. Delay of surgery for medical investigations normally should not occur. Preoperative optimization may have value for the occasional patient with correctable cardiac arrhythmias, uncontrolled left-ventricular failure, some reversible coagulopathies, severe anemia, poorly controlled diabetes.

See article for full details.

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† Corresponding article on page 1336.

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with severe hyperglycemia, major electrolyte disturbances, or chest infections with sepsis. Another relatively common scenario is an elderly anticoagulated patient with atrial fibrillation. Although the risk of bleeding must always be weighed against thrombembolism, surgery can usually proceed quickly, even in warfarin-treated patients, if prothrombin complex concentrates are used to return the international normalized ratio to less than 1.5. Moreover, simply withholding the newer oral anticoagulants dabigatran, rivaroxaban, and apixaban, for 1 to 2 days, may be effective if renal function is preserved. When this is not so, best practice has yet to be established, but may include prothrombin complex concentrates.

New scoring systems may offer better 1-yr mortality prediction and may facilitate discussions with the patient and family. Whether neuraxial anesthesia with sedation associates with better outcomes than general anesthesia remains the subject of learned debates, nevertheless neuraxial anesthesia is our preference when not contraindicated. The patient’s capacity to give consent must be respected, together with any applicable living wills or powers of attorney.

There is a move in the United States to perform total hip arthroplasty rather than hemiarthroplasty or pinning hip fixation for the more active geriatric patient with a displaced femoral neck fracture. Even though there is a higher rate of dislocation after total hip replacement, the elderly active patient with a displaced femoral neck fracture treated by a total hip arthroplasty has a better function score and lower revision rate than hemiarthroplasty or hip pinning surgery. Intertrochanteric hip fractures in the elderly population is typically fixed by a sliding hip screw or an intramedullary nail. Although the intramedullary nail is more expensive and has greater revision rates than the sliding hip screw, the intramedullary nail is gaining popularity because of its typically easier to place and has biomechanical advantages.

Patients benefit from appropriate diet, adequate multimodal analgesia with regular acetaminophen, opioids and regional nerve blocks, and thromboprophylaxis. Early mobilization is the cornerstone of better outcomes and helps avoid pressure sores. Indwelling urinary catheters should be avoided or removed as soon as possible. Measures to prevent subsequent falls should be in place and rehabilitation planning should begin on admission. Good premorbid function, mental state and available social support, together with nutritional supplementation, and early assessment by a multidisciplinary team facilitate rehabilitation. While the length of hospital stay for primary and revision hip arthroplasty between 1991 and 2008 has decreased, there has been an increase in rate of discharge to postacute care and readmission. Supported discharge schemes may allow safe discharge reducing acute hospital stays and readmission.

Frail elderly patients with major comorbidities present challenges and opportunities for improved care. A multidisciplinary physician coordinated strategy is consistent with the intent of the American Society of Anesthesiologists’ Perioperative Surgical Home collaborative, which is to develop standardized clinical assessment and management plans to deliver patient-centered care. These properly implemented efforts should achieve the “triple aim” of improving health, improving delivery of health care, and reducing the cost of care. These goals will be met through “shared decision-making and seamless continuity of care for the surgical patient, from the decision for surgery through recovery, discharge, and beyond.” The orchestrating physician must be conversant in the management of the multitude of complex perioperative issues, and able to integrate care from a variety of healthcare professionals, for it is in caring for patients with hip fractures that we have most often seen delayed surgery from unnecessary preoperative laboratory testing and consultations. Anesthesiologists, surgeons, internists, and consulting specialists have been equally at fault. Therefore, we foresee great benefit if a Perioperative Surgical Home can manage to fend off unnecessary preoperative consultations and investigations while facilitating prompt surgery. For nearly every such patient, it is only after having undergone surgery that they can benefit from the coordinated orthogeriatric care proposed by Bodaert et al.

We must identify the best practices for management of elderly patients needing surgical care for hip fractures. It will be very difficult to perform a randomized prospective study to definitively settle the issue of operative timing. Moja et al. performed an exhaustive analysis of the literature and presented suggestive data that surgical procedures should be performed within 2 days of admission. Early hip surgery was associated with a lower risk of death and of pressure sores. We note that it is more humane to proceed with surgical care expeditiously. One study, of patients over 90 yr of age, found that patients with more comorbidities had significantly greater risk of complications and mortality when the surgery was delayed more than 24 h. These patient present with medical risks that cannot be eliminated. Prompt operative management is the best way to reduce pain and facilitate regaining the ability to walk.

Delirium is present on admission in 21% of patients with hip fracture and first appears postoperatively in 36%. Perioperative delirium strongly associates with dementia 6 months later. Preventing or reducing delirium will likely have significant benefits for the elderly patient. However, despite comprehensive geriatric assessment, tight blood glucose control, immediate review and optimization of all medications, early and intensive mobilization, early discharge planning, limited fasting, and nutritious postoperative meals the incidence of delirium and long-term cognitive impairment was unchanged in patients treated for hip fractures. More research is needed.

This clearly is not a trivial problem and it will inevitably become more prevalent. We must redouble our efforts to minimize the damage from these seemingly minor but in fact devastating fractures. With “buy in” from surgeons, administrators, and other stakeholders and better data regarding best practices, we believe that the Perioperative Surgical Home could reduce unnecessary variation in processes and systems. In so doing, the Perioperative Surgical Home will
incorporate the benefits from “orthogeriatrics,” as described by Boddaert et al., with the end result being better outcomes.

Competing Interests
The authors are not supported by, nor maintain any financial interest in, any commercial activity that may be associated with the topic of this article.

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